COMPUTER CONTROLLED AM/FM STEREO SYNTHESIZER TUNER

T-91/91L

SERVICE MANUAL

KENWOOD

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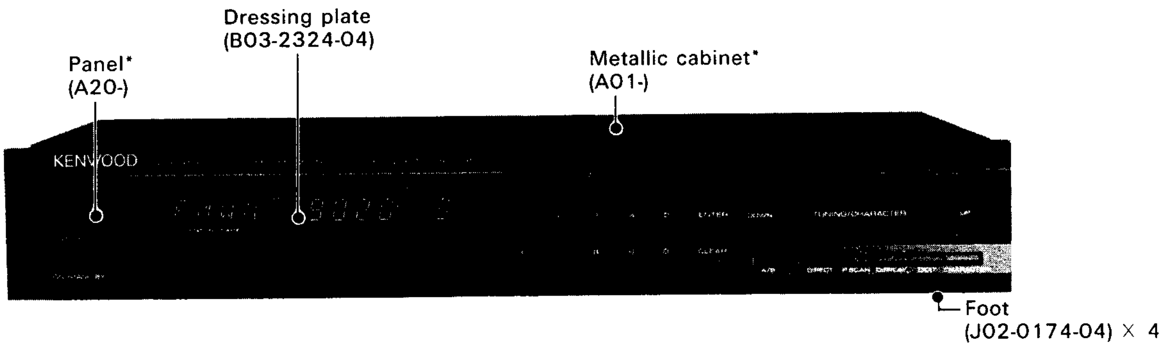
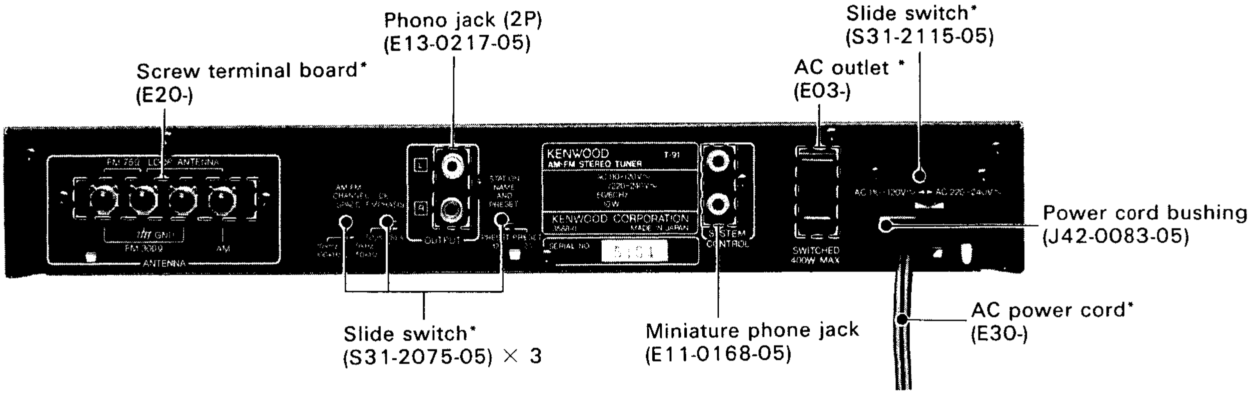
4329


Panel*
(A20-)
Dressing plate
(B03-2324-04)
Metallic cabinet*
(A01-)
KENWOOD
Foot
(J02-0174-04) × 4


Phono jack (2P)
(E13-0217-05)
Slide switch*
(S31-2115-05)
Screw terminal board*
(E20-)
AC outlet *
(E03-)
Power cord bushing
(J42-0083-05)
AC power cord*
(E30-)
Slide switch*
(S31-2075-05) × 3
Miniature phone jack
(E11-0168-05)
KENWOOD
AM-FM STEREO TUNER
T-91
KENWOOD CORPORATION
MADE IN JAPAN
SERIAL NO.
ANTENNA
AM
OUTPUT
SYSTEM CONTROL
SWITCHED 400W MAX

*** Refer to parts list on page 46.**
Photo is T-91.

4329

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SPECIFICATIONS .... Back cover

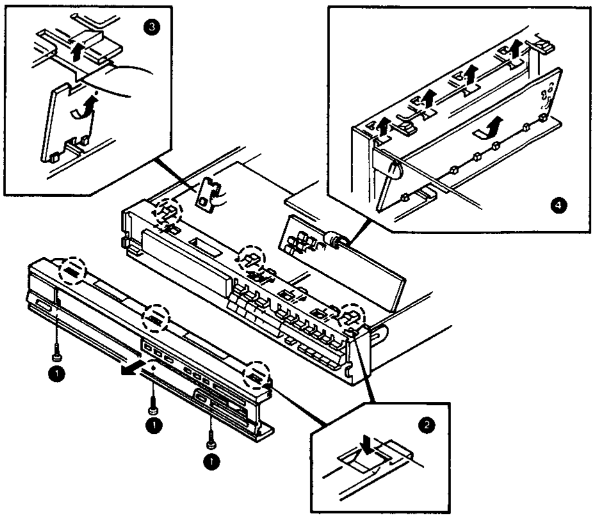
Caution

○ Always connect the power cord of the tuner to an UNSWITCHED power outlet of the amplifier. If it is connected to a SWITCHED outlet, system power cannot be turned on at once.

DISASSEMBLY FOR REPAIR

(Remove the metallic cabinet before proceeding to the following.)

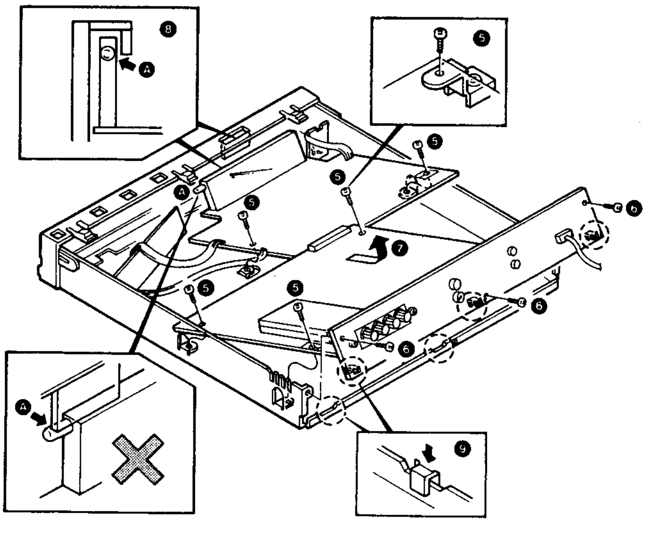
1. Remove the 3 screws holding the front panel and sub-panel ass'y to the bottom (❶).
2. Disengage the 3 lugs holding the front panel to the sub-panel ass'y from the upper side (❷), and remove the front panel in the direction of the arrow.
3. Disengage the lug behind the sub-panel ass'y and remove the Power Switch Board (X14-) (C/3) (❸).
4. Disengage the 4 lugs behind the sub-panel ass'y and remove the Control Switch Board (X14-) (B/3) (❹).



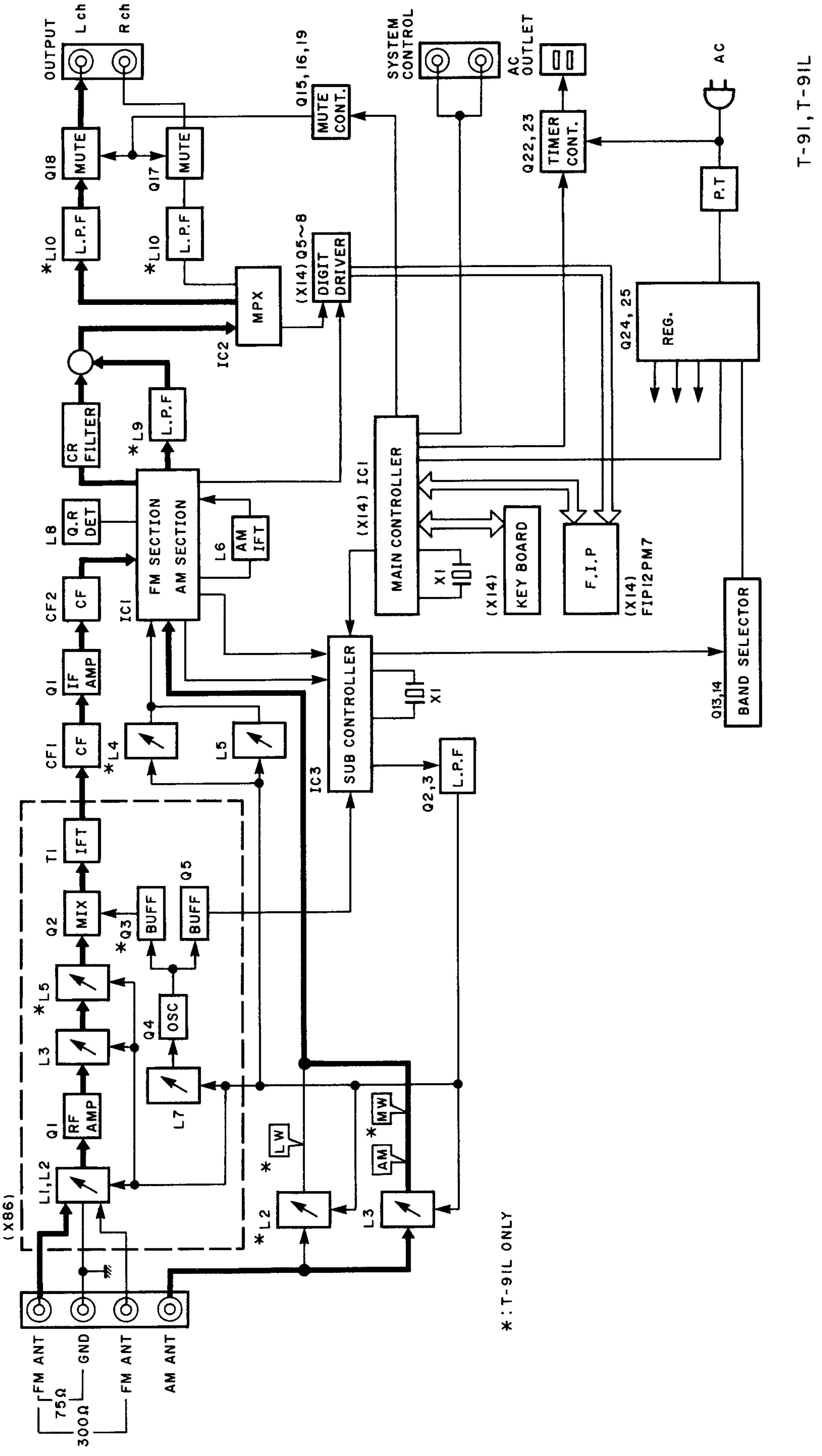
5. Remove the 5 screws holding the Tuner Unit (X05-3410-10) and Display Unit (X14-2210-11) (A/3) to the chassis (❺).
6. Remove the 3 screws holding the rear panel to the chassis (❻).
7. Without separating the Tuner Unit (X05-) and Display Unit (X14-) (A/3), remove these PC boards and the rear panel together in the direction of the arrow (❼). During this, pay special attention not to hit the top right projection of the FL indicator tube against the sub-panel ass'y or any other part (Ⓐ).

(Caution for assembly)

8. When attaching the FL indicator tube to the sub-panel ass'y, be careful of the lugs on the sub-panel ass'y (❽).
9. When attaching the rear panel to the chassis, be sure to engage the 3 lugs on the rear panel with the dented sections on the chassis (❾).



BLOCK DIAGRAM


FM ANT
75Ω
GND
300Ω
FM ANT
AM ANT
(X86)
L1,L2
Q1
RF AMP
L3
*L5
Q2
MIX
T1
IFT
L7
Q4
OSC
*Q3
BUFF
Q5
BUFF
CF1
CF
Q1
IF AMP
CF2
CF
*L4
L5
IC1
FM SECTION
AM SECTION
L6
AM IFT
L8
Q.R DET
CR FILTER
*L9
L.P.F
IC2
MPX
*L10
L.P.F
Q18
MUTE
Q17
MUTE
OUTPUT
L ch
R ch
Q15,16,19
MUTE CONT.
(X14) Q5~8
DIGIT DRIVER
*L2
L3
*LW
AM
*MW
IC3
SUB CONTROLLER
X1
Q2,3
L.P.F
(X14) IC1
MAIN CONTROLLER
X1
(X14)
KEY BOARD
F.I.P
(X14)
FIP12PM7
SYSTEM CONTROL
AC OUTLET
Q22,23
TIMER CONT.
AC
P.T
Q24,25
REG.
Q13,14
BAND SELECTOR
T-91, T-91L
*: T-91L ONLY

CIRCUIT DESCRIPTION

Function of components
Tuner unit (X05-3410-10)

Component	Purpose, Function	Operation, Condition, Interchangeability
IC1 (LA1265)	FM/AM system IC	FM IF amplification, detection and control. AM MIX, IF amplification and detection.
IC2 (AN7470)	MPX IC	MPX demodulation.
IC3 (LM7001)	Frequency synthesizer PLL IC	PLL synthesizer.
Q1	FM IF amplifier	10.7 MHz amplifier.
Q2,3	L.P.F.	LPF for the PLL.
Q4	LPF switching	Time-constant switching during LW reception.
Q5	FM-AM switching	IC1 mode switching. OFF during AM reception.
Q6	LPF control	Q4 control, OFF for LW reception.
Q7,8	AM RF switching	Electronic RF switching for LW and MW.
Q9,10	AM OSC switching	Electronic OSC switching for LW and MW.
Q11	Buffer	Impedance conversion.
Q12	Inverter amplifier	Auto Stop control.
Q13,14	Tuner band switching	FM/MW/LW band switching
Q15,16	Mute control	Operates during function switching.
Q17,18	Mute switching	Activates muting during function switching.
Q19	Mute driver	Operates during function switching.
Q20	Constant voltage	Regulation of +12V.
Q22	Power driver	+12V power supply ON/OFF.
Q23	Power control	Power ON/OFF control.
Q24	Constant voltage	Regulation of +5V.
Q25	Constant voltage	CE control, regulation of +5V.
Q26	Tuner band switching	FM/MW/LW band switching.

CIRCUIT DESCRIPTION

Display unit (X14-2210-11)

Component	Purpose, Function	Operation, Condition, Interchangeability
IC1 (CXP5016-210S)	Microprocessor	System control.
Q1	Channel switching	FM-AM channel space switching, or LW channel switching.
Q2	Preset switching	Switching between 20 ch presets and 12 ch presets, station name switching.
Q3	FIP driver	FIP display driver.
Q4	Control	Control of Q3, based on signals from the microprocessor.
Q5	FIP control	Supply of +5V to Q6 at power ON.
Q6	FIP driver	TUNED indicator.
Q7	FIP driver	STEREO indicator.
Q9	Inverter amplifier	Reset control.

Front-end unit (X86-1040-10): T-91

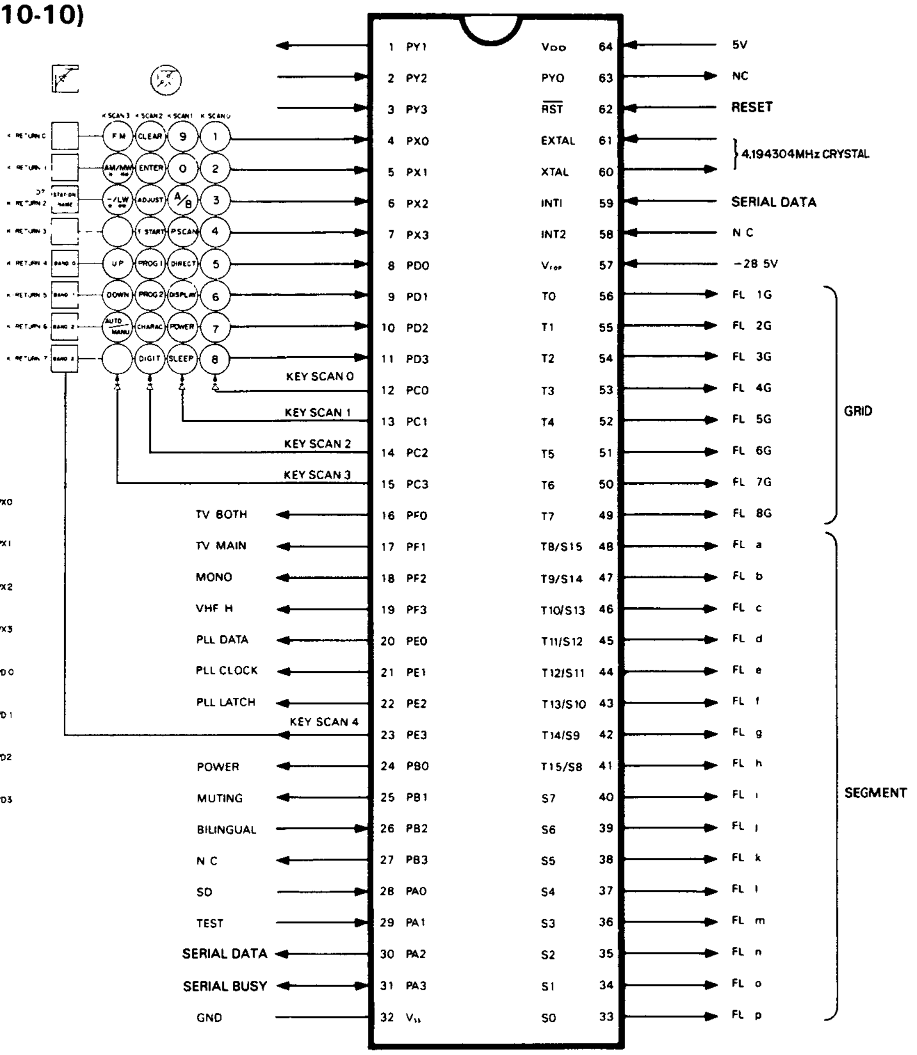
Component	Purpose, Function	Operation, Condition, Interchangeability
Q1	RF amplifier	
Q2	FM mixer	
Q4	OSC buffer	
Q5	OSC	

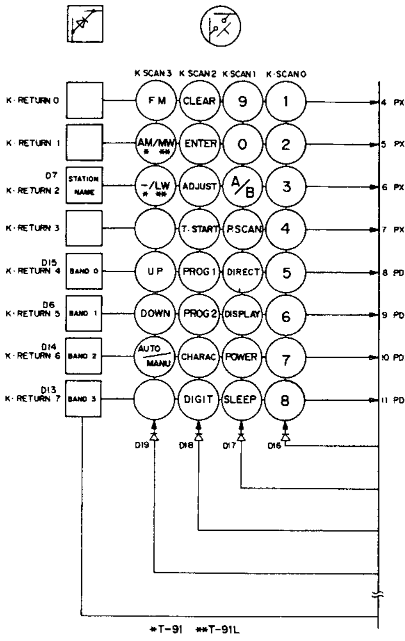
Front-end unit (X86-1052-70): T-91L

Component	Purpose, Function	Operation, Condition, Interchangeability
Q1	RF amplifier	
Q2	FM mixer	
Q3	Tuned buffer	
Q4	OSC buffer	
Q5	OSC	

CIRCUIT DESCRIPTION

IC1: CXP5016-210S (X14-2210-10)
Microprocessor
Key matrix connection


1 PY1
2 PY2
3 PY3
4 PX0
5 PX1
6 PX2
7 PX3
8 PD0
9 PD1
10 PD2
11 PD3
12 PC0
13 PC1
14 PC2
15 PC3
16 PF0
17 PF1
18 PF2
19 PF3
20 PE0
21 PE1
22 PE2
23 PE3
24 PB0
25 PB1
26 PB2
27 PB3
28 PA0
29 PA1
30 PA2
31 PA3
32 Vss
VDD 64
PY0 63
RST 62
EXTAL 61
XTAL 60
INT1 59
INT2 58
VFDP 57
T0 56
T1 55
T2 54
T3 53
T4 52
T5 51
T6 50
T7 49
T8/S15 48
T9/S14 47
T10/S13 46
T11/S12 45
T12/S11 44
T13/S10 43
T14/S9 42
T15/S8 41
S7 40
S6 39
S5 38
S4 37
S3 36
S2 35
S1 34
S0 33
5V
NC
RESET
4.194304MHz CRYSTAL
SERIAL DATA
N C
−28 5V
FL 1G
FL 2G
FL 3G
FL 4G
FL 5G
FL 6G
FL 7G
FL 8G
GRID
FL a
FL b
FL c
FL d
FL e
FL f
FL g
FL h
FL i
FL j
FL k
FL l
FL m
FL n
FL o
FL p
SEGMENT
KEY SCAN 0
KEY SCAN 1
KEY SCAN 2
KEY SCAN 3
KEY SCAN 4
TV BOTH
TV MAIN
MONO
VHF H
PLL DATA
PLL CLOCK
PLL LATCH
POWER
MUTING
BILINGUAL
N C
SD
TEST
SERIAL DATA
SERIAL BUSY
GND
K SCAN 3
K SCAN 2
K SCAN 1
K SCAN 0
FM
CLEAR
9
1
AM/MW
ENTER
0
2
−/LW
ADJUST
A/B
3
T.START
P.SCAN
4
UP
PROG 1
DIRECT
5
DOWN
PROG 2
DISPLAY
6
AUTO MANU
CHARAC
POWER
7
DIGIT
SLEEP
8


K SCAN 3
K SCAN2
K SCAN1
K SCAN0
K RETURN 0
K RETURN 1
D7
K RETURN 2
STATION NAME
K RETURN 3
D15
K RETURN 4
BAND 0
D6
K RETURN 5
BAND 1
D14
K RETURN 6
BAND 2
D13
K RETURN 7
BAND 3
FM
CLEAR
9
1
AM/MW
* **
ENTER
0
2
−/LW
* **
ADJUST
A/B
3
T.START
P.SCAN
4
UP
PROG 1
DIRECT
5
DOWN
PROG 2
DISPLAY
6
AUTO MANU
CHARAC
POWER
7
DIGIT
SLEEP
8
D19
D18
D17
D16
4 PX0
5 PX1
6 PX2
7 PX3
8 PD0
9 PD1
10 PD2
11 PD3
*T-91 **T-91L

Functions of diodes and switches

(0: Without diode, 1: With diode)

Destination Type	Set Switches				Band	Receiving Frequency Range	Inter-Channel Space	Intermediate Frequency	PLL IC1 (LM7001)				μ-Com IC Port	Auto Tuning
	B3	B2	B1	B0					PLL Reference Frequency	PLL Input Terminal	PLL Port		YHFH⑲	
											B02⑧	B03⑨		
K	1	0	0	0	FM	87.5MHz-108.0MHz	100kHz	+10.7MHz	50kHz	FMIN	H	L	L	o
					AM	530kHz-1610kHz	10kHz	+450kHz	10kHz	AMIN	L	H	L	o
E1	1	*1	0	0	FM	87.5MHz-108.0MHz	50kHz	+10.7MHz	50kHz	FMIN	H	L	L	o
					AM	531kHz-1602kHz	9kHz	+450kHz	9kHz	AMIN	L	H	L	o
E2					FM	87.5MHz-108.0MHz	50kHz	+10.7MHz	50kHz	FMIN	H	L	L	o
	1	1	0	1	MW	531kHz-1602kHz	9kHz	+450kHz	9kHz	AMIN	L	H	L	o
					LW	153kHz-281kHz	1kHz	+450kHz	1kHz	AMIN	H	H	L	o
E3	1	1	**1	1	FM	87.5MHz-108.0MHz	50kHz	+10.7MHz	50kHz	FMIN	H	L	L	o
					MW	531kHz-1602kHz	9kHz	+450kHz	9kHz	AMIN	L	H	L	o
					LW	153kHz-281kHz	1kHz	+450kHz	1kHz	AMIN	H	H	L	**x

* The T-91 Types M,U and UE are modified into Types E1 or K by switching the inter-channel space with the CHANNEL SPACE SW (S31) on the rear panel and by adding a diode (1SS133) for BAND 2.
Before switching, turn the AC off (by pulling out the power plug), switch the switch, and turn AC on again.
If the AC power is left ON, switching the switch does not change the destination.

** With the T-91L (France made), a diode (ISS133) is added for BAND 1 to perform manual tuning in LW only.

CIRCUIT DESCRIPTION

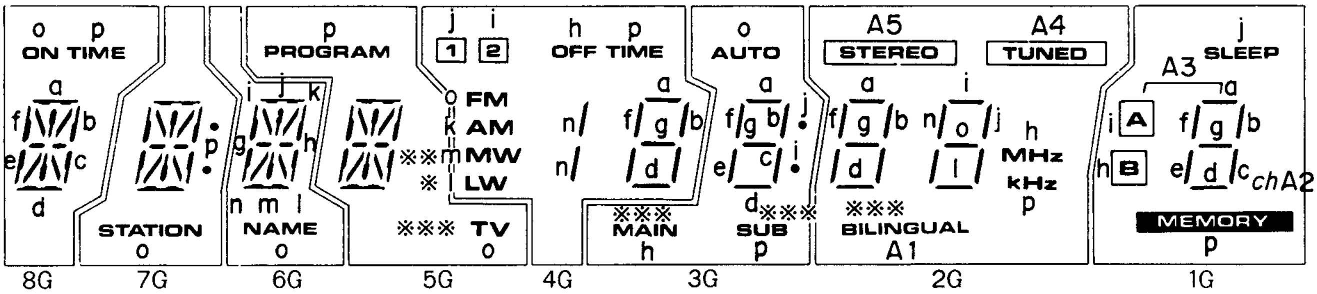
Terminal description

<table>
<tr><th>Terminal No.</th><th>Symbol</th><th>Name</th><th>I/O</th><th>H/L</th><th>Function</th></tr>
<tr><td>1</td><td>PY1</td><td>N.C.</td><td>O</td><td>H</td><td>Not used. On the PC board, make it capable of being pulled up using a registor.</td></tr>
<tr><td>2</td><td>PY2</td><td>C.E.</td><td>I</td><td>H</td><td>Backup (AC OFF) detection terminal. H: AC ON
When L level is detected, the backup condition is set and the clock is stopped. L: AC OFF
Note: The rise from L to H shall be faster than the rise of reset.</td></tr>
<tr><td>3</td><td>PY3</td><td>N.C.</td><td>I</td><td>—</td><td>Not used. Pull down with the GND or a resistor.</td></tr>
<tr><td>4-11</td><td>PX0 ~ PD3</td><td>KEY RETURN 0 ~ 7</td><td>I</td><td>H</td><td>Key return input. H: AC ON
All pulled down (10k to 100k) L: AC OFF</td></tr>
<tr><td>12 ~ 15</td><td>PC0 ~ PC3</td><td>KEY SCAN 0 ~ 3</td><td>O</td><td>H</td><td>Key scanning signals.</td></tr>
<tr><td>16</td><td>PF0</td><td>TV BOTH</td><td>O</td><td>H/L</td><td rowspan="2">TV bilingual multiplexed audio mode control terminals.
<table>
<tr><th>Mode \ Port</th><th>PF0 ⑯</th><th>PF1 ⑰</th></tr>
<tr><td>MAIN</td><td>L</td><td>H</td></tr>
<tr><td>SUB</td><td>H</td><td>L</td></tr>
<tr><td>BOTH</td><td>H</td><td>H</td></tr>
</table></td></tr>
<tr><td>17</td><td>PF1</td><td>TV MAIN</td><td>O</td><td>H/L</td></tr>
<tr><td>18</td><td>PF2</td><td>MONO</td><td>O</td><td>H</td><td>Mono/Auto stereo control terminal. H: MONO
Permanently L during TV bilingual reception. L: AUTO STEREO</td></tr>
<tr><td>19</td><td>PF3</td><td>VHF H</td><td>O</td><td>H/L</td><td>Band selection control terminal.
Selects the band by the combination with BO2 ⑧ and BO3 ⑨ of PLL IC.
<table>
<tr><th>Mode \ Port</th><th>BO2 ⑧</th><th>BO3 ⑨</th><th>PF3 ⑲</th></tr>
<tr><td>FM</td><td>H</td><td>L</td><td>L</td></tr>
<tr><td>AM</td><td>L</td><td>H</td><td>L</td></tr>
<tr><td>LW</td><td>H</td><td>H</td><td>L</td></tr>
</table></td></tr>
<tr><td>20</td><td>PE0</td><td>PLL DATA</td><td>O</td><td>H</td><td>PLL IC data output. Connected to LM7001 DATA ⑤ terminal.</td></tr>
<tr><td>21</td><td>PE1</td><td>PLL CLOCK</td><td>O</td><td>H</td><td>PLL IC clock output. Connected to LM7001 CLK ④ terminal.</td></tr>
<tr><td>22</td><td>PE2</td><td>PLL LATCH</td><td>O</td><td>H</td><td>PLL IC latch output. Connected to LM7001 CE ③ terminal.</td></tr>
<tr><td>23</td><td>PE3</td><td>KEY SCAN 4</td><td>O</td><td>H</td><td>Key scanning signal.</td></tr>
<tr><td>24</td><td>PB0</td><td>POWER</td><td>O</td><td>H</td><td>Relay control terminal. H: POWER ON
L: POWER OFF</td></tr>
<tr><td>25</td><td>PB1</td><td>MUTING</td><td>O</td><td>H</td><td>Muting control during band switching, frequency scanning, etc. H: MUTE ON
L: MUTE OFF</td></tr>
<tr><td>26</td><td>PB2</td><td>BIL</td><td>I</td><td>H</td><td></td></tr>
<tr><td>27</td><td>PB3</td><td>N.C.</td><td>O</td><td>—</td><td>Not used. Pull down with a resistor.</td></tr>
<tr><td>28</td><td>PA0</td><td>SD</td><td>I</td><td>H</td><td>Stop signal input for auto tuning. H: TUNE
L: NO SIGNAL</td></tr>
<tr><td>29</td><td>PA1</td><td>TEST</td><td>I</td><td>L</td><td>Test mode setting input. H: NORMAL
L: TEST</td></tr>
<tr><td>30</td><td>PA2</td><td>SDATA</td><td>O</td><td>H</td><td>System control DATA output.</td></tr>
<tr><td>31</td><td>PA3</td><td>SBUSY</td><td>I/O</td><td>H</td><td>System control BUSY input/output.</td></tr>
<tr><td>32</td><td>Vss</td><td>GND</td><td>—</td><td>—</td><td>GND terminal.</td></tr>
<tr><td>33</td><td>S0</td><td>p</td><td>O</td><td>H</td><td>FL segment drive terminal (FL segment terminal p)</td></tr>
<tr><td>34</td><td>S1</td><td>o</td><td>O</td><td>H</td><td>FL segment drive terminal (FL segment terminal o)</td></tr>
<tr><td>35</td><td>S2</td><td>n</td><td>O</td><td>H</td><td>FL segment drive terminal (FL segment terminal n)</td></tr>
<tr><td>36</td><td>S3</td><td>m</td><td>O</td><td>H</td><td>FL segment drive terminal (FL segment terminal m)</td></tr>
<tr><td>37</td><td>S4</td><td>l</td><td>O</td><td>H</td><td>FL segment drive terminal (FL segment terminal l)</td></tr>
<tr><td>38</td><td>S5</td><td>k</td><td>O</td><td>H</td><td>FL segment drive terminal (FL segment terminal k)</td></tr>
<tr><td>39</td><td>S6</td><td>j</td><td>O</td><td>H</td><td>FL segment drive terminal (FL segment terminal j)</td></tr>
<tr><td>40</td><td>S7</td><td>i</td><td>O</td><td>H</td><td>FL segment drive terminal (FL segment terminal i)</td></tr>
<tr><td>41</td><td>T15/S8</td><td>h</td><td>O</td><td>H</td><td>FL segment drive terminal (FL segment terminal h)</td></tr>
<tr><td>42</td><td>T14/S9</td><td>g</td><td>O</td><td>H</td><td>FL segment drive terminal (FL segment terminal g)</td></tr>
<tr><td>43</td><td>T13/S10</td><td>f</td><td>O</td><td>H</td><td>FL segment drive terminal (FL segment terminal f)</td></tr>
<tr><td>44</td><td>T12/S11</td><td>e</td><td>O</td><td>H</td><td>FL segment drive terminal (FL segment terminal e)</td></tr>
<tr><td>45</td><td>T11/S12</td><td>d</td><td>O</td><td>H</td><td>FL segment drive terminal (FL segment terminal d)</td></tr>
<tr><td>46</td><td>T10/S13</td><td>c</td><td>O</td><td>H</td><td>FL segment drive terminal (FL segment terminal c)</td></tr>
<tr><td>47</td><td>T9/S14</td><td>b</td><td>O</td><td>H</td><td>FL segment drive terminal (FL segment terminal b)</td></tr>
<tr><td>48</td><td>T8/S15</td><td>a</td><td>O</td><td>H</td><td>FL segment drive terminal (FL segment terminal a)</td></tr>
</table>

CIRCUIT DESCRIPTION

Terminal No.	Symbol	Name	I/O	H/L	Function
49	T7	8G	O	H	FL grid drive terminal (FL grid terminal 8G)
50	T6	7G	O	H	FL grid drive terminal (FL grid terminal 7G)
51	T5	6G	O	H	FL grid drive terminal (FL grid terminal 6G)
52	T4	5G	O	H	FL grid drive terminal (FL grid terminal 5G)
53	T3	4G	O	H	FL grid drive terminal (FL grid terminal 4G)
54	T2	3G	O	H	FL grid drive terminal (FL grid terminal 3G)
55	T1	2G	O	H	FL grid drive terminal (FL grid terminal 2G)
56	T0	1G	O	H	FL grid drive terminal (FL grid terminal 1G)
57	VFDP				FL-ve power supply (-28.5V).
58	INT2		I	H	Not used. Connected to VDD.
59	INT1	DATAI	I	H	System control DATA input.
60	XTAL	CL1	—	—	Clock oscillator terminals. X'tal 4.194304MHz.
61	EXTAL	CL2	—		
62	$\overline{\text{RST}}$	RESET	I	H	Reset signal input. H: NORMAL L: RESET
63	PY0		O	H	Not used. Open (On the PC board, make it capable of being pulled up.).
64	VDD				+B terminal (5V).

FL1 : FIP12PM7 (X14-2210-11)
Fluorescent indicator tube
Terminal connection


o p
ON TIME
a b c d e f
STATION
o
PROGRAM
p
i j k g h n m l
NAME
o
j i
1 2
FM
AM
MW
LW
※※※ TV
o
h p
OFF TIME
o
AUTO
※※※
MAIN
h
SUB
p
A5
STEREO
A4
TUNED
MHz
kHz
※※※
BILINGUAL
A1
j
SLEEP
A3
A
B
chA2
MEMORY
p
8G
7G
6G
5G
4G
3G
2G
1G

※ Function only in T-91, ※※ Function only in T-91L

※※※ Does not function

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12								
Electrode	F	F	P(i)	8G	P(j)	P(n)	7G	P(o)	P(k)	P(m)	6G	P(l)								
Pin No.	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Electrode	5G	P(n)	P(k)	P(i)	P(j)	5G	4G	4G	3G	P(o)	P(p)	P(A5)	P(A4)	3G	NP	2G	P(A3)	P(A2)	P(A1)	P(h)
Pin No.									33	34	35	36	37	38	39	40	41	42	43	44
Electrode									P(d)	2G	P(e)	P(c)	1G	P(g)	P(f)	P(b)	1G	P(a)	F	F

Notes F: Filament P: Anode G: Grid NP: No pin

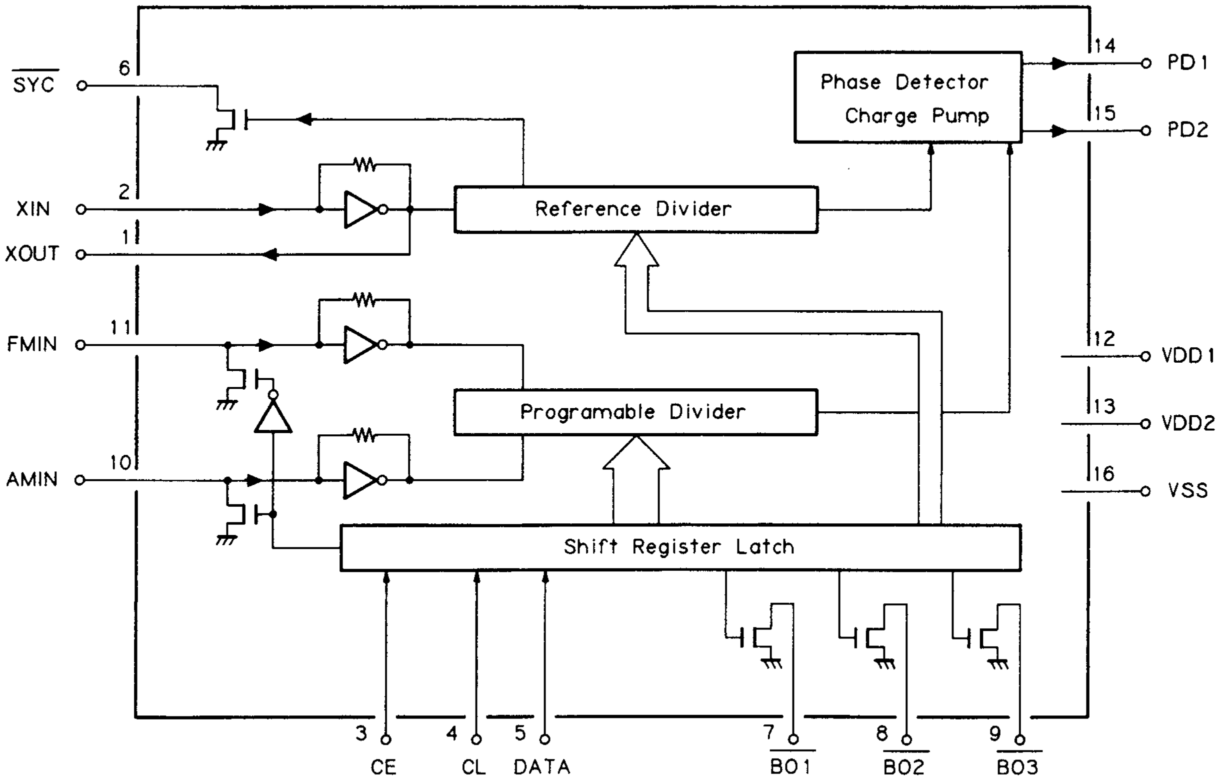
Caution: Pins 3 and 16 (i segment), pins 5 and 17 (j segment), pins 6 and 14 (n segment), pins 8 and 22 (o segment) and pins 9 and 15 (k segment) are not internally connected to each other.

Please connect each pair externally (by means of a PC board, for example).

CIRCUIT DESCRIPTION

IC3: LM7001 (X05-3410-10)
PLL frequency synthesizer

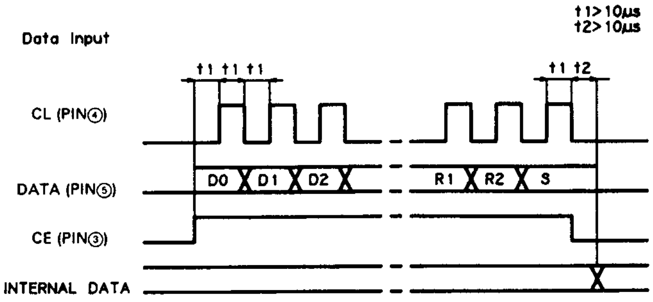
Block diagram


$\overline{\text{SYC}}$
6
XIN
2
XOUT
1
FMIN
11
AMIN
10
Phase Detector
Charge Pump
Reference Divider
Programable Divider
Shift Register Latch
14
PD1
15
PD2
12
VDD1
13
VDD2
16
VSS
3
CE
4
CL
5
DATA
7
$\overline{\text{BO1}}$
8
$\overline{\text{BO2}}$
9
$\overline{\text{BO3}}$

Terminal description

Pin no.	Pin name	I/O	Function
1	XOUT	O	Crystal oscillator (7.2 MHz).
2	XIN	I	
3	CE	I	Data input.
4	CL	I	
5	DATA	I	
6	$\overline{\text{SYC}}$	I/O	Clock for controller (400 kHz).
7	$\overline{\text{BO1}}$	O	Band data output. $\overline{\text{BO1}}$ can be used as a time base output (8 Hz)
8	$\overline{\text{BO2}}$	O	
9	$\overline{\text{BO3}}$	O	
10	AMIN	I	Local oscillator signal input.
11	FMIN	I	
12	VDD1		Power supply. VDD2 for back-up.
13	VDD2		
14	PDD1	O	Charge pump output.
15	PD2	O	
16	VSS		Power supply.

CIRCUIT DESCRIPTION


Data Input
t1>10μs
t2>10μs
t1 t1 t1
t1 t2
CL (PIN④)
DATA (PIN⑤)
D0
D1
D2
R1
R2
S
CE (PIN③)
INTERNAL DATA

←Input at D0

D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	T0	T1	B0	B1	B2	TB	R0	R1	R2	S

(1) D0(LSB)～D13(MSB): Dividing ratio data
FMIN uses D0 - D13 and AMIN uses D4 - D13.

D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	
1	0	1	0	0	0	0	0	0	1	0	1	1	1	→ FMIN dividing ratio=14853
LSB													MSB	
X	X	X	X	0	0	0	0	0	1	0	1	1	1	→ AMIN dividing ratio=928
				LSB									MSB	

(2) T0, T1 For LSI checking (0,0):

(3) B0～B2: Band data
Time base data

Input				Output		
B0	B1	B2	TB	$\overline{B01}$	$\overline{B02}$	$\overline{B03}$
0	0	0	0	*	*	*
0	0	1	0	0	0	1
0	1	0	0	0	1	0
0	1	1	0	0	1	1
1	0	0	0	1	0	0
1	0	1	0	1	0	1
1	1	0	0	1	1	0
1	1	1	0	1	1	1
0	0	0	1	TB	*	*
X	1	0	1	TB	1	0
X	0	1	1	TB	0	1
X	1	1	1	TB	1	1
1	0	0	1	TB	0	0

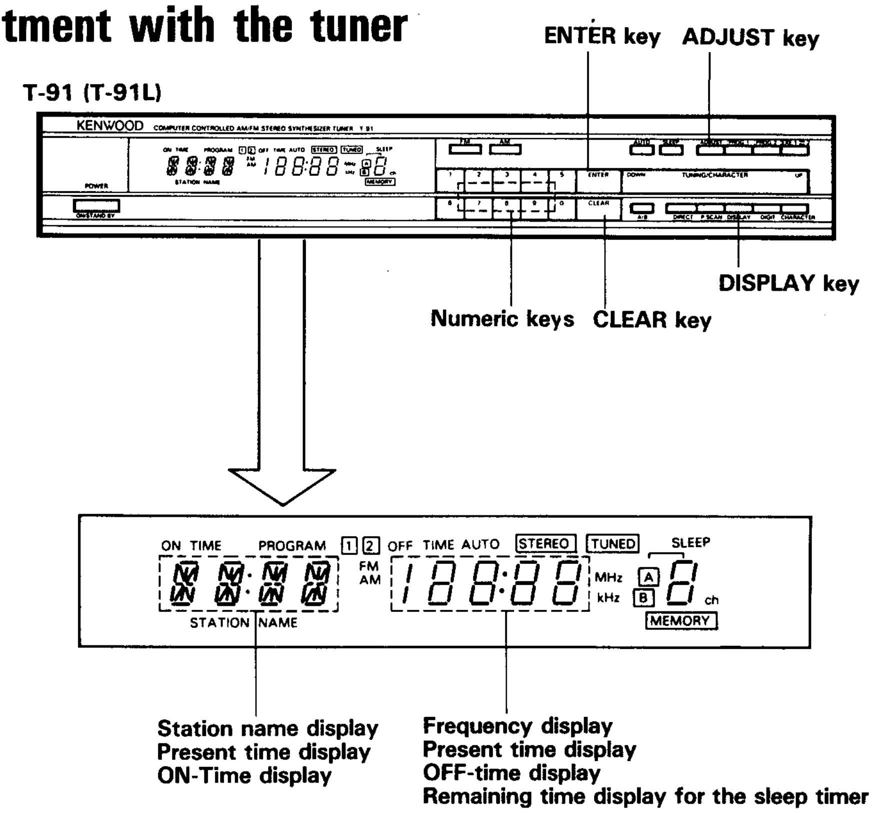
$: Determined by R01～R2
X : don't care.
TB: 8 Hz

(4) R0～R2: Reference frequency data

R0	R1	R2	fref	$\overline{B01}$	$\overline{B02}$	$\overline{B03}$
0	0	0	100 kHz	1	1	0
0	0	1	50	1	1	0
0	1	0	25	1	1	0
0	1	1	5	0	0	1
1	0	0	10	1	0	1
1	0	1	9	1	0	1
1	1	0	1	0	1	1
1	1	1	5	0	0	1

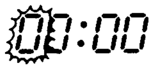
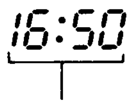
(5) S: Divider selection data
'1' : FMIN, '0' : AMIN

Time adjustment with the tuner


ENTER key
ADJUST key
T-91 (T-91L)
KENWOOD
DISPLAY key
Numeric keys
CLEAR key
ON TIME PROGRAM 1 2 OFF TIME AUTO STEREO TUNED SLEEP
FM
AM
MHz
kHz
A
B
ch
STATION NAME
MEMORY
Station name display
Present time display
ON-Time display
Frequency display
Present time display
OFF-time display
Remaining time display for the sleep timer

How to adjust the present time

1. Press the tuner POWER switch ON.
2. When the display shows the frequency, press the DISPLAY key to change to the clock display.
3. Adjust the present time in following manner.

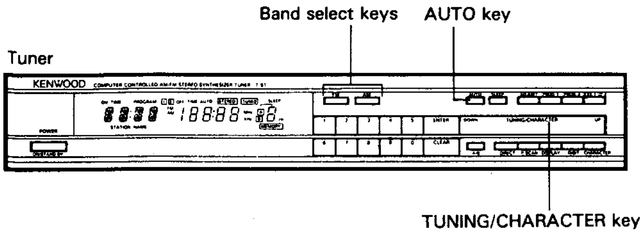
Operation	Display window	Comment
1. Press ADJUST		The hour display on the left starts flashing.
2. Input the hour and minute using ten key (1 to 0)		24 hour display is used. Every input advances the flashing to the right by one. This indicates where to input the next. Input in the order of 0 → 9 → 0 → 5
Example		
9:05		Input in the order of 1 → 6 → 5 → 0
16:50		When 4 digits are input, the entire time display flashes. If a wrong time is input, press the CLEAR key and perform operation 2 and after. The entire time display illuminates and seconds are counted.
3. Press ENTER key.	 Illuminates.	Set the hour and minute according to operations 1 and 2. Use the time service from your TV, radio or telephone, then press ENTER key. This operation is practical and convenient. Pressing ADJUST key while setting the time brings the operation back to the first operation.

Note:
If the power is interrupted, or the power cord is disconnected from the AC outlet, after the present time has been set, the time display will blink continuously. In this case, adjust the present time again from step (1).

Listening to broadcasts

To listen to FM and AM (T-91), or FM/MW/LW (T-91L)

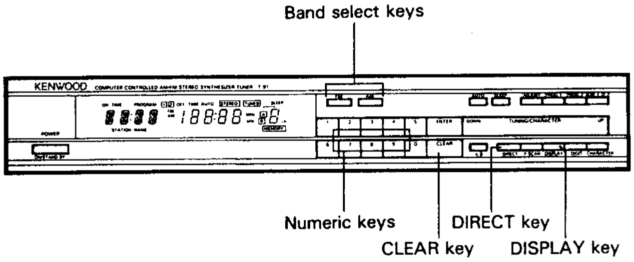
Auto/Manual tuning



1. **Select the desired band with the band select keys (FM/AM for T-91, FM/MW/LW for the T-91L).**
2. **Press the AUTO key to select the tuning mode, auto or manual. (While in auto tuning mode, the AUTO indicator lights in the display window.)**

- **In auto tuning mode,** pressing the TUNING/CHARACTER key once will tune to the first broadcast station in the direction of the key pressed, and then tuning stops. When a stereo broadcast is received, the STEREO indicator lights in the display.
- **In manual tuning mode,** each time the TUNING/CHARACTER key is pressed, the frequency is moved up or down by one step. When it is kept pressed, the frequency is continuously moved up or down until the key is released, when the required station reaches.

Direct tuning



This function allows you to tune to a desired station by directly entering the frequency.

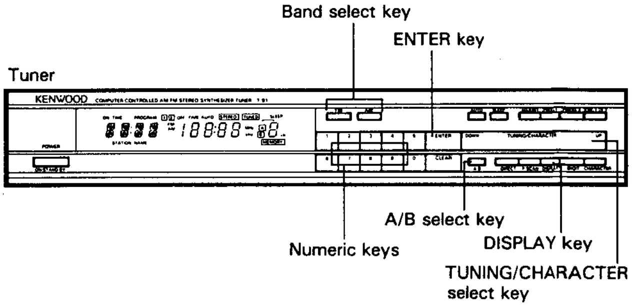
1. **Select the band with the band select keys (FM/AM for the T-91, FM/MW/LW for the T-91L).**
2. **Press the DISPLAY key to display the frequency, then press the DIRECT key when the frequency is displayed.**
   - The first column in which the first frequency number is to be input begins blinking.
3. **Referring to the input example, input the frequency numbers using the numeric keys.**
4. **The tuner tunes to the frequency of the station which is input.**
   - If the input frequency is out of the band range, the frequency display blinks for 5 seconds, and an error display appears, then the previous mode resumes.
5. **If the numbers are incorrectly input by mistake, press the CLEAR key.**
   - When the CLEAR key is pressed, first column input mode resumes.

Frequency input example with the numeric keys

- **Example for radio broadcasts**

FM:	101.00 MHz	1, 0, 1, 0 (100 kHz space) 1, 0, 1, 0, 0 (50 kHz space)
AM:	810 kHz	8, 1, 0
AM:	1240 kHz	1, 2, 4, 0

How to preset broadcasts (FM/AM for the T-91, FM/MW/LW for the T-91L)



A total of 12 stations can be preset if the station names are attached to each, and a total of 20 stations can be preset if no station names are included. (Select either mode with the STATION NAME AND PRESET select key located on the rear of the tuner.)

Station Name and Preset select key on the rear of the tuner

◧ : When station names are also displayed (6 stations for each A and B preset)

◨ : When station names are not displayed (10 stations for each A and B preset)
(Setting when shipped)

Notes:

1. **Be sure to change the setting of the STATION NAME AND PRESET switch (preset channel select switch) after unplugging the power cord of the tuner from the AC outlet.**
2. **If this operation is performed after setting the broadcast frequencies, all the preset contents will be cleared.**

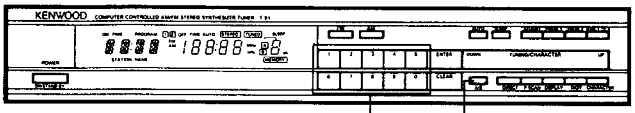
1. **Press the DISPLAY key to display the frequency.**
2. **Select the desired band with the band select keys (FM/AM for the T-91, FM/MW/LW for the T-91L).**
3. **Tune to the station you wish to stored in memory using the TUNING/CHARACTER key, or by the direct tuning method.**
   - When storing the station name, input it at this time, referring to the "Station name display" section on page 22. (The station name can also be input after storing the frequency.)
4. **Press the ENTER key.**
   - "MEMORY" is displayed in the display window.
5. **Select preset group A or B with the A/B select key.**
   - If this operation is omitted, the currently indicated preset group is selected.

6. **Within 5 seconds, press any of the 1 to 6 (when the station name is required), or 1 to 10 (when the station name is not required), numeric keys.**
   - The MEMORY indicator goes off and the number corresponding to the numeric key pressed appear in the preset channel display. In the same way, preset other stations.

Notes:
1. **When a new station is stored in a preset channel in which another station has been stored, the previously preset station is cleared and the newly preset station is stored in memory.**
2. **Press a numeric key (1 to 0) after releasing the ENTER key.**
3. **If a numeric key (1 to 0) is pressed while pressing the ENTER key, the same frequency may also be stored in another preset channel.**
4. **When the station name is also stored, the 7 to 0 numeric keys do not function.**

How to select the preset channel

Tuner



Numeric keys

A/B select key

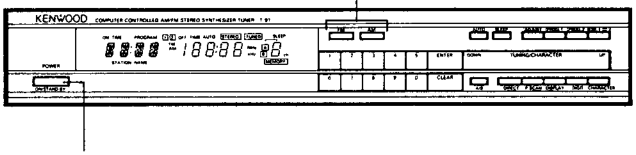
Select the preset channel group A or B with the A/B select key, and select the desired preset channel with the numeric keys (1 to 0).
- When A/B selection is not performed, the currently indicated group is selected.

Note:
When the station names are also stored in memory, the 7 to 0 numeric keys cannot be used for recalling the preset stations.

Last channel memory

BAND select key

Tuner



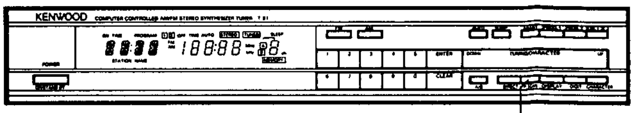
POWER switch

When the tuner's power is first turned ON, when the band is changed (between FM and AM for the T-91, between FM, MW, and LW for the T-91L), or when the input selector on the amplifier is changed from another source to the tuner, the last received broadcast will be recalled for each band (FM/AM for the T-91, FM/MW/LW for the T-91L).

Note:
If the power cord is disconnected from the AC outlet, the preset frequencies will be cleared after about 3 days have elapsed.

How to perform a preset scan

Tuner



P.SCAN key

1. **Press the P.SCAN key.**
   - Each of the preset frequencies will be received for about 5 seconds in sequence. When a frequency is not stored, the frequency stored in the next preset channel will be recalled after one second. The preset channel scanning operation starts from the next channel if any of the preset channel is being received; if not, it is started from channel A-1. (As in the following figure.)

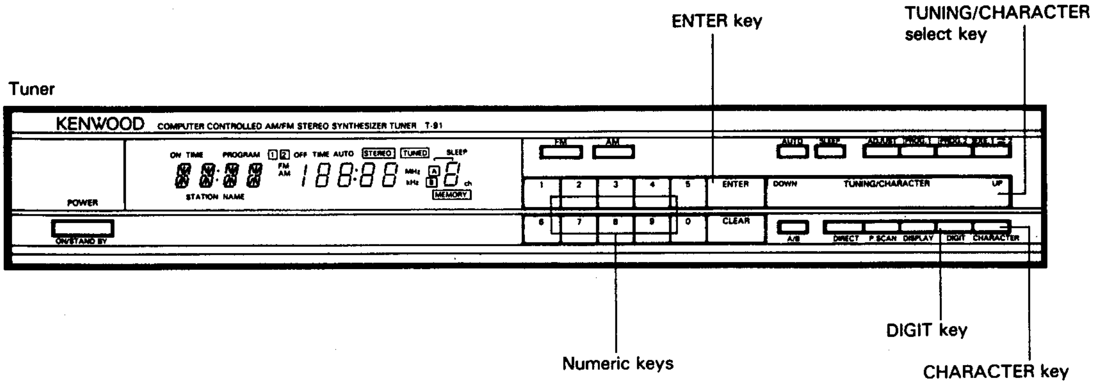
(A-0) (B-0)

→ A-1 → A-2 ...... A-6 → B-1 → B-2 ...... B-6 →

Displays are as shown in parentheses (__) when the station names have not been registered.

2. **To release preset scanning, press the P.SCAN key again.**

Station name display (Station name preset)


ENTER key
TUNING/CHARACTER select key
Tuner
KENWOOD COMPUTER CONTROLLED AM/FM STEREO SYNTHESIZER TUNER T-91
POWER
ON/STAND BY
STATION NAME
MEMORY
FM
AM
ENTER
CLEAR
DOWN
TUNING/CHARACTER
UP
A/B
DIRECT
P.SCAN
DISPLAY
DIGIT
CHARACTER
DIGIT key
Numeric keys
CHARACTER key

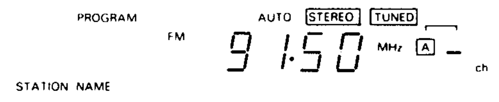
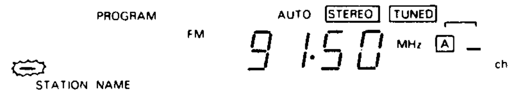
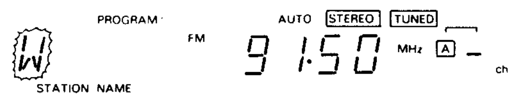
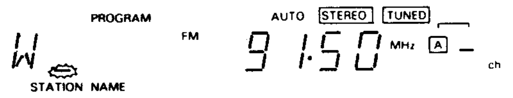
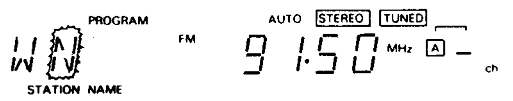
First set the STATION NAME AND PRESET switch located on the rear panel of the tuner to the "12" side. (The tuner is shipped with this setting.)

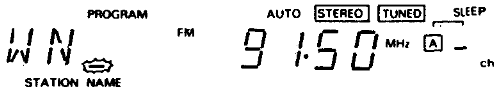
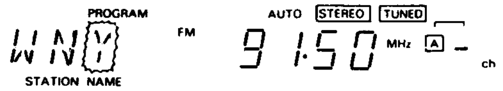
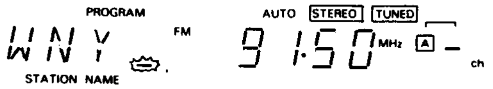
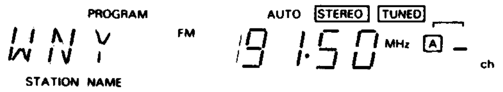
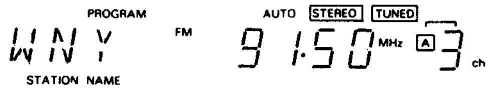
How to input characters

Example 1:
When a broadcast not stored in the preset channel is received. Receive FM 91.5 MHz and then input the character "WNY" to be preset into the A-3 channel.

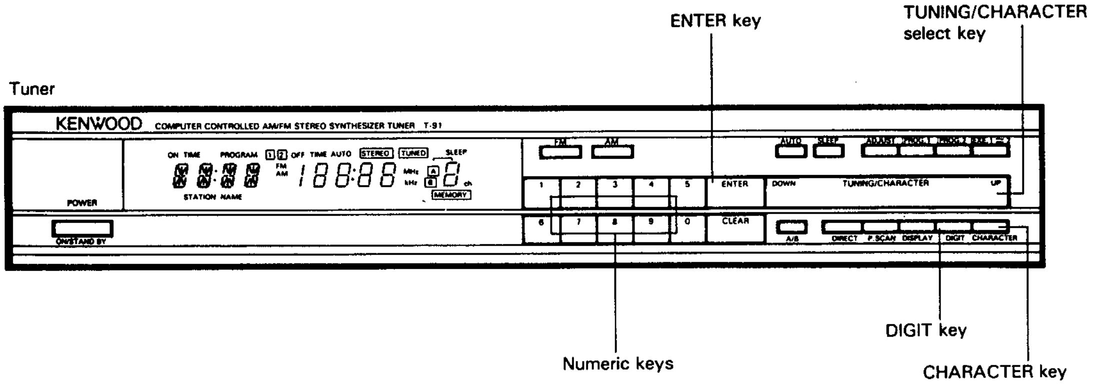
Character display selected by the TUNING/CHARACTER key

→ A → B → C ...... Z ...... 0 → 1 → 2 → 3 9

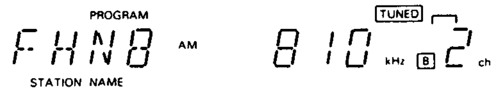
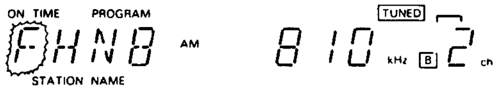
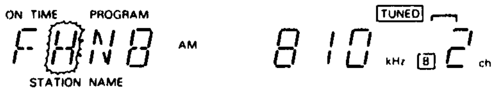
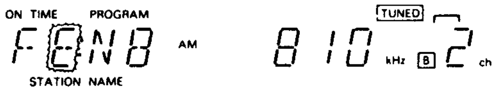
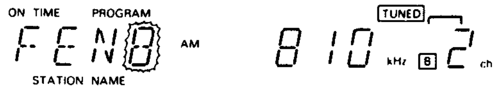
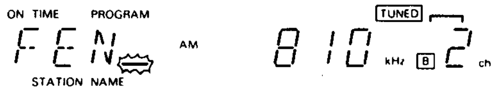
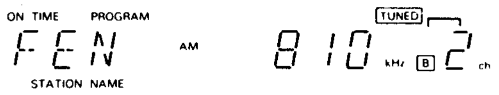
Step	Operation	Display
1.	**Tune to the FM 91.5 MHz station.**	 PROGRAM AUTO STEREO TUNED FM 91.50 MHz A - ch STATION NAME
2.	**Press the CHARACTER key.** Character input mode is engaged, and the first column in the character display section begins blinking.	 PROGRAM AUTO STEREO TUNED FM 91.50 MHz A - ch STATION NAME
3.	**Press the TUNING/CHARACTER key to select "W".**	 W PROGRAM AUTO STEREO TUNED FM 91.50 MHz A - ch STATION NAME
4.	**Press the DIGIT key.** The blinking column shifts to the next column (on the right).	 W PROGRAM AUTO STEREO TUNED FM 91.50 MHz A - ch STATION NAME
5.	**Press the TUNING/CHARACTER key to select "N".**	 WN PROGRAM AUTO STEREO TUNED FM 91.50 MHz A - ch STATION NAME

Step	Operation	Display
6.	**Press the DIGIT key.**	 PROGRAM AUTO STEREO TUNED SLEEP WN FM 91.50 MHz A - ch STATION NAME
7.	**Press the TUNING/CHARACTER key to select "Y".**	 PROGRAM AUTO STEREO TUNED WNY FM 91.50 MHz A - ch STATION NAME
8.	**Press the DIGIT key.**	 PROGRAM AUTO STEREO TUNED WNY FM 91.50 MHz A - ch STATION NAME
9.	**Press the DIGIT key or the CHARACTER key.**	 PROGRAM AUTO STEREO TUNED WNY FM 91.50 MHz A - ch STATION NAME
10.	**Press the ENTER key, then press the "3" numeric key.**	 PROGRAM AUTO STEREO TUNED WNY FM 91.50 MHz A 3 ch STATION NAME

- When inputting characters, the character selected by the memory is initially set to enable character selection.
- If a character is input by mistake, press the CLEAR key to return to the first column.
- Even in the middle of inputting, pressing the CHARACTER key twice will release character input mode. At this time, the characters which have already been input will be stored in memory.
- When inputting of the characters is completed for any of the preset channel received, the input character data will automatically be stored into the preset channel which is currently being received.


ENTER key
TUNING/CHARACTER select key
Tuner
KENWOOD COMPUTER CONTROLLED AM/FM STEREO SYNTHESIZER TUNER T-91
POWER
ON/STAND BY
ENTER
CLEAR
DOWN
TUNING/CHARACTER
UP
A/B
DIRECT
P.SCAN
DISPLAY
DIGIT
CHARACTER
DIGIT key
Numeric keys
CHARACTER key

Example 2:
To change the station name for AM 810 kHz, stored in the B-2 memory, from "FHN 8" to "FEN"

Step	Operation	Display
1.	**According to "How to recall a preset channel", recall the station using the A/B select key and the numeric keys.**	 PROGRAM TUNED STATION NAME AM kHz B ch
2.	**Press the CHARACTER key.**	 ON TIME PROGRAM TUNED STATION NAME AM kHz B ch
3.	**Press the DIGIT key to send the blinking column to the next one.**	 ON TIME PROGRAM TUNED STATION NAME AM kHz B ch
4.	**Press the TUNING/CHARACTER key to select "E".**	 ON TIME PROGRAM TUNED STATION NAME AM kHz B ch
5.	**Press the DIGIT key twice.**	 ON TIME PROGRAM TUNED STATION NAME AM kHz B ch
6.	**Press the TUNING/CHARACTER key to select a blank "_".**	 ON TIME PROGRAM TUNED STATION NAME AM kHz B ch
7.	**Press the DIGIT key or the CHARACTER key.**	 ON TIME PROGRAM TUNED STATION NAME AM kHz B ch

How to use the timer

The timer incorporated in the tuner can be used in the following four ways.

When Using timer play (for awakening, etc.), be careful of the volume level on the amplifier.

1. Timer play with the tuner

1 Set the desired start time and the broadcast station according to "How to set the timer program" on page 26.
2 Remove the disc if one is loaded in the CD player.
3 Set the TIMER switch on the cassette deck to OFF.
4 Press the "TUNER" Input Selector key on the amplifier.
5 Adjust the volume level with the VOLUME key on the amplifier.
6 Set the POWER switch of the amplifier or tuner to STANDBY.

When the preset time is reached, power is automatically supplied to the tuner and broadcast reception begins.

2. Timer play with the CD player (DP-710)

1 Set the desired start time according to "How to set the timer program" on page 26. (Leave the preset channel on the tuner set to any desired position.)
2 Load a disc in the CD player.
3 Set the TIMER switch on the cassette deck to OFF.
4 Adjust the volume level with the VOLUME key on the amplifier.
5 Set the POWER switch of the amplifier or tuner to STANDBY.

When the preset is time reached, the Input Selector will be automatically set to the CD position and play will start in the CD player.

3. Timer play with the cassette deck

1 Set the desired start time according to "How to set the timer program" on page 26.
2 Load a recorded cassette tape into the cassette deck.
3 Set the DOLBY NR switch of the cassette deck depending on the tape used.
4 Set the DIRECTION switch of the cassette deck as desired.
5 Set the TIMER switch of the cassette deck to the PLAY position.
6 Adjust the volume level with the VOLUME key on the amplifier.
7 Set the POWER switch of the amplifier or tuner to STANDBY.

When the preset time is reached, power is automatically supplied to the cassette deck and tape playback starts.

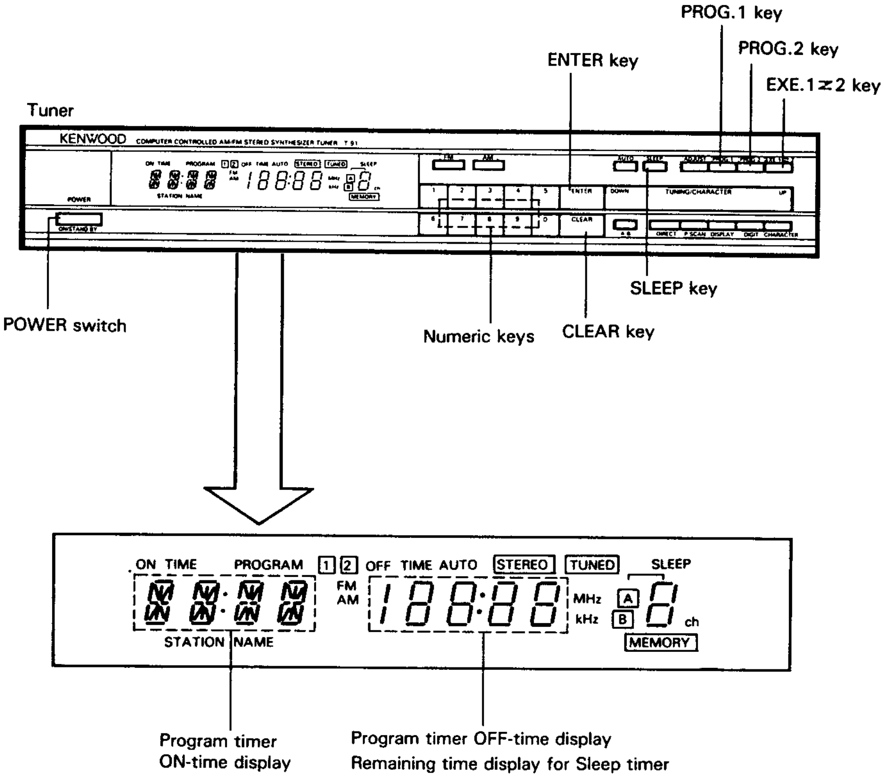
4. Timer recording of broadcasts

1 Set the start and stop times with the tuner according to "How to set the timer program" on page 26.
2 Load a recordable cassette in the A deck or the B deck.
3 Set the DOLBY NR switch of the cassette deck to the desired position.
4 Set the DIRECTION switch of the cassette deck to the desired position.
5 Set the TIMER switch of the cassette deck to REC.
6 When performing timer recording (unattended recording), be sure to minimize the volume level of the amplifier, or set the MUTING switch of the amplifier to ON.
7 Set the POWER switch of the amplifier or tuner to STANDBY.

When the preset time is reached, recording starts automatically on the cassette deck.

Timer function

Timer program and sleep timer functions are provided with this tuner. The timer program function is used for timer playback or timer recording, and 2 pairs of ON-times and OFF times can be preset. The timer function will continue every day once the preset times are set.


PROG.1 key
ENTER key
PROG.2 key
EXE.1⇄2 key
Tuner
KENWOOD
POWER switch
SLEEP key
Numeric keys
CLEAR key
ON TIME
PROGRAM
[1] [2]
OFF TIME AUTO
STEREO
TUNED
SLEEP
FM
AM
MHz
kHz
A
B
ch
STATION NAME
MEMORY
Program timer ON-time display
Program timer OFF-time display
Remaining time display for Sleep timer

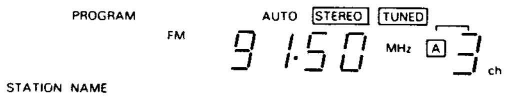
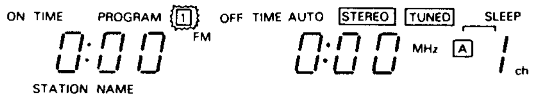
How to set the timer program

Before operating, be sure to adjust the present time (refer to page 19).
Before setting a timer program, preset the broadcast frequencies.

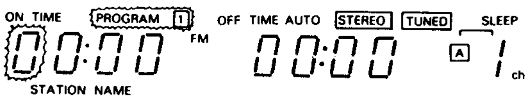
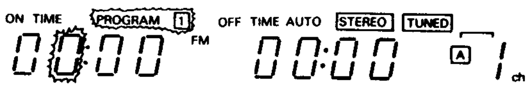
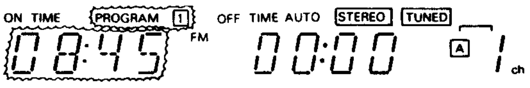
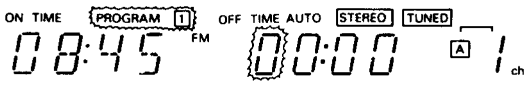
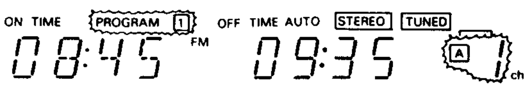
- **How to set the timer (Common to program [1] and [2])**

  Timer setting is possible only when the power is ON, but the contents of the timer program can be checked with the power OFF.

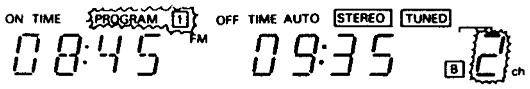
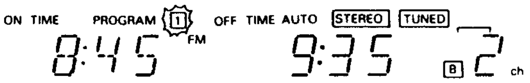
Example 1:
To set the ON-time (8:45) and OFF-time (9:35) for Timer [1], with a preset channel (B-2)

Step	Operation	Display	Description
1.	**Present status:** An FM 91.5 MHz broadcast, which is stored in the A-3 channel, is being received.	 PROGRAM AUTO STEREO TUNED FM 9 1.5 0 MHz A 3 ch STATION NAME	
2.	Press the PROG.1 key.	 ON TIME PROGRAM [1] OFF TIME AUTO STEREO TUNED SLEEP 0:0 0 FM 0:0 0 MHz A 1 ch STATION NAME	When the PROG.1 key is pressed, a "[1]" blinks and the contents of program timer [1] are displayed. The display appears for about 5 seconds. During that time, pressing the ENTER key engages timer setting mode. When the display appears, pressing the PROG.1 key again will resume the previous status.

• ✺ shows the indicator or display blinking.

Step	Operation	Display	Description
3.	**Press the ENTER key.**	 ON TIME PROGRAM 1 OFF TIME AUTO STEREO TUNED SLEEP 00:00 FM 00:00 A 1 ch STATION NAME	When the ENTER key is pressed, the "PROGRAM 1 "indicator blinks, to show that timer setting mode is engaged. At the same time, the first column of the ON TIME display begins to blink, which shows that the time can be input. When the ON time is not changed, press the ENTER key to shift the blinking column to the OFF TIME.
4.	**ON-time input:** Input numeric key "0".	 ON TIME PROGRAM 1 OFF TIME AUTO STEREO TUNED 00:00 FM 00:00 A 1 ch	When a "0" is input, the first column of the ON TIME display, a "0", is changed to light steadily, and the second column begins to blink. If a number is input incorrectly or by mistake, press the CLEAR key to return the blinking column to the first one. Then input new numbers from the first column.
5.	**ON-time input with the numeric keys:** Input in the order 8 → 4 → 5	 ON TIME PROGRAM 1 OFF TIME AUTO STEREO TUNED 08:45 FM 00:00 A 1 ch	When the four ON time columns are completed, the entire ON time display begins to blink, to show that the ON-time input has been finished. If it is complete, press the ENTER key. If only three columns are required, press the ENTER key when the three numbers are input. To correct the input numbers, press the CLEAR key. The display returns to the first column to accept the new numbers.
6.	**ON-time set:** Press the ENTER key.	 ON TIME PROGRAM 1 OFF TIME AUTO STEREO TUNED 08:45 FM 00:00 A 1 ch	When inputting character is complete, the ON-time display is lit steadily, and the first column of the OFF-time begins to blink, to accept the OFF time input. At this time, if the ON-time is mistakenly input, press the CLEAR key to return to the first column for new numbers to be input.
7.	**OFF time input and set:** Input in the order 0 → 9 → 3 → 5, the press the ENTER key.	 ON TIME PROGRAM 1 OFF TIME AUTO STEREO TUNED 08:45 FM 09:35 A 1 ch	When the OFF-time input is completed, the OFF time display is lit steadily, and the preset channel indicator begins blinking, to show that preset channel input mode has been entered. At this time, if the time is input by mistake, press the CLEAR key once to return to OFF-time input mode, and press it twice to return to ON-time input mode. If it is not necessary to modify the OFF-time, press the ENTER key.

- ✺ shows the indicator or display blinking.

Step	Operation	Display	Description
8.	**Preset channel input:** Select B with the A/B select key and input "2" with the numeric key.	 ON TIME PROGRAM 1 OFF TIME AUTO STEREO TUNED 08:45 FM 09:35 B 2 ch	When the A/B select key is pressed, the currently selected preset channel indicator is changed (A → B or B → A). When a numeric key is pressed, the input number appears in the preset channel display. If mistakenly input, press the CLEAR key to return to the previous status.
9.	**Timer set completion** Press the ENTER key.	 ON TIME PROGRAM 1 OFF TIME AUTO STEREO TUNED 8:45 FM 9:35 B 2 ch	When the preset channel input is completed, press the ENTER key. The preset channel indicator and the "PROGRAM" indicator lights steadily, to show that the timer setting is finished. This display status continues for about 5 seconds, then the initial status resumes.

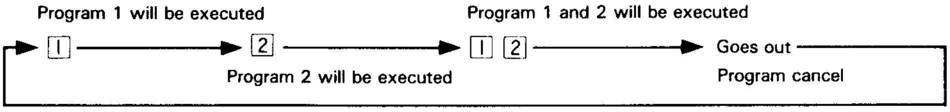
Notes:

1. **When setting the timer to program 1, pressing the PROG.1 key will release timer setting mode and the initial status resumes. (Program 2 operates in the same way.)**
2. **When the station names are also stored, the selectable preset channels are 1 to 6 for both A and B.**

To use the timer

A timer operation will be performed by setting the EXE.1 ⇄ 2 key. Each time this key is pressed, a timer program is selected in the following order:

Change of the Program 1 / 2 indicators


Program 1 will be executed
1
2
Program 2 will be executed
Program 1 and 2 will be executed
1 2
Goes out
Program cancel

When the timer function is not used

Press the EXE.1 ⇄ 2 key so that both program indicators, [1] and [2], go out.

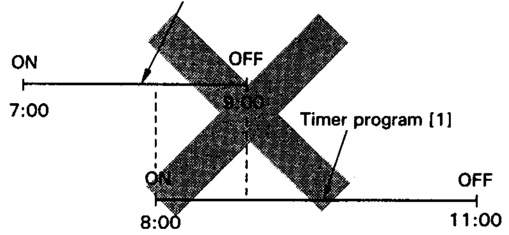
To check the timer program

Press the PROG1 or PROG2 key. The contents of the program will be displayed for about 5 seconds, then the initial status resumes.

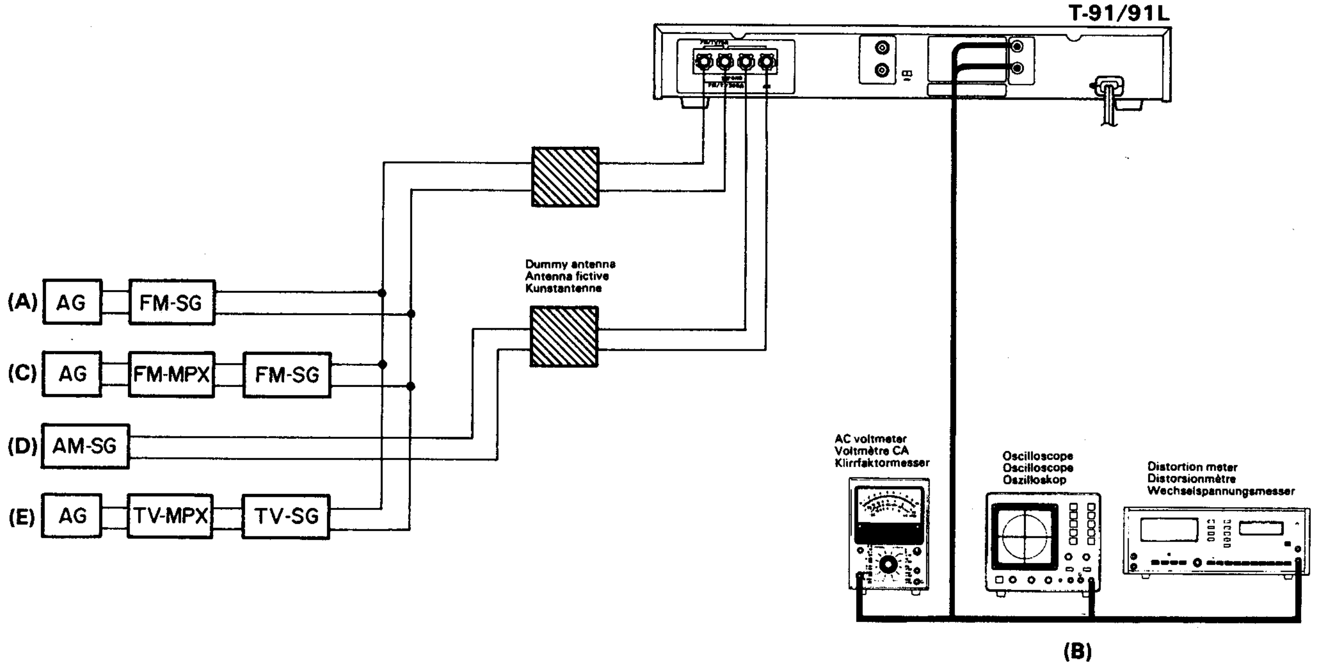
Notes:

1. **A timer operation will be performed only when PROGRAM indicator [1] and/or [2] is lit.**
2. **If a timer operation is engaged when the EXE.1 ⇄ 2 key or the POWER switch is pressed, the timer operation will not be performed correctly.**
3. **Set the times of program [1] and [2] so that their times do not overlap each other. (Refer to the example in the figure on the right.)**
   - When both programs [1] and [2] are set, program [2] will be engaged before program [1].
   - Even when the ON-time of program [1] is reaches while program [2] is engaged, program [1] will not be activated.
   - When the ON-time of program [2] is reached while program [1] is engaged, program [2] operation will be activated.
4. **If program [1] and [2] are required to be performed continuously, leave one minute between the two programs.**
   Example:
   To receive an 91.5 MHz broadcast for 1 hour from 8 o'clock, then receive a 954 kHz broadcast for 1 hour from 9 o'clock, set the ON-time of program [1] to 8:00 and the OFF-time to 8:59, then set the ON-time of program [2] to 9:00 and the OFF-time to 10:00.
5. **When the timer is activated, timer operation will be performed every day at the same time. If the timer operation is not required, release the timer function according to "When the timer function is not used" on page 29.**
6. **With the timer function activated (PROGRAM [1] and/or [2] indicator is lit), when the timer ON-time is reached while listening to a broadcast, the timer operation will be executed and the receiving broadcast will be changed to the broadcast preset by the timer. For this, when recording from the tuner, be sure to check the timer program.**
7. **The contents of the timer program cannot be cancelled. So, when the timer operation is not required, release the timer function according to "When the timer function is not used" on page 29.**

Example



ADJUSTMENT



ADJUSTMENT

No.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	TUNER SETTINGS	ALIGNMENT POINTS	ALIGN FOR	FIG.
FM SECTION	Unless otherwise specified, the individual switches should be set as following: SELECTOR: FM MODE: FM MODE/AUTO						
1	BAND EDGE (1)	–	Connect a DC voltmeter between TP10(VT) and TP11(GND).	87.5MHz	L7 (Front end)	2.5V	(a)
2	BAND EDGE (2)	–	Connect a DC voltmeter between TP10(VT) and TP11(GND).	108.0MHz	TC1 (Front end)	8.0V	(a)
Repeat alignments 1 and 2 several times.							
3	RF ALIGNMENT	(A) 98.0MHz 1kHz,±75kHz dev	(B)	MONO 98.0MHz	※ L2,3,5 (Front end)	Maximum amplitude and symmetry of the oscilloscope display.	
4	DISCRIMINATOR	(A) 98.0MHz 1kHz,±75kHz dev 60dBμ(ANT input)	Connect a DC voltmeter between TP1 and TP2.	MONO 98.0MHz	L8	0V	(b)
5	VCO	(A) 98.0MHz 0 dev 60dBμ(ANT input)	Connect a 330kΩ resistor to TP8. Connect a frequency counter to the resistor via an AC voltmeter.	98.0MHz	VR3	19.00kHz	(c)
6	DISTORTION (STEREO)	(C) 98.0MHz 1kHz,±68.25kHz dev Selector:L or R 60dBμ(ANT input)	(B)	98.0MHz	T1 (Front end)	Minimum distortion. (L or R)	
7	SEPARATION (E,T only)	(C) 98.0MHz 1kHz,±68.25kHz dev Selector:L or R 60dBμ(ANT input)	(B)	98.0MHz	VR4	Minimum crosstalk.	
8	TUNING LEVEL	(A) 98.0MHz 0 dev 18dBμ(ANT input)	–	98.0MHz	VR1	Adjust VR1 so that FL1(TUNED) goes off. Then, adjust VR1 and stop at the point where FL1(TUNED) goes on.	
AM-MW SECTION	Keep the AM loop antenna installed. SELECTOR: AM(T-91) or MW(T-91L)						
(1)	BAND EDGE (1)	–	Connect a DC voltmeter between TP10(VT) and TP11(GND).	530kHz (531kHz)	L5	1.5V	(a)
(2)	BAND EDGE (2)	–	Connect a DC voltmeter between TP10(VT) and TP11(GND).	1610kHz (1602kHz)	TC4	8.0V	(a)
Repeat alignments (1) and (2) several times.							
(3)	RF ALIGNMENT (1)	(D) 630kHz 400Hz,30% mod	(B)	630kHz	L3	Maximum amplitude and symmetry of the oscilloscope display.	
(4)	RF ALIGNMENT (2)	(D) 1440kHz 400Hz,30% mod	(B)	1440kHz	TC2	Maximum amplitude and symmetry of the oscilloscope display.	
Repeat alignments (3) and (4) several times.							
AM-LW SECTION(T-91L only)	Keep the AM loop antenna installed. SELECTOR: LW						
(5)	BAND EDGE (1)	–	Connect a DC voltmeter between TP10(VT) and TP11(GND).	153kHz	L4	1.5V	(a)
(6)	BAND EDGE (2)	–	Connect a DC voltmeter between TP10(VT) and TP11(GND).	281kHz	TC3	8.0V	(a)
Repeat alignments (5) and (6) several times.							
(7)	RF ALIGNMENT (1)	(D) 162kHz 400Hz,30% mod	(B)	162kHz	L2	Maximum amplitude and symmetry of the oscilloscope display.	
(8)	RF ALIGNMENT (2)	(D) 270kHz 400Hz,30% mod	(B)	270kHz	TC1	Maximum amplitude and symmetry of the oscilloscope display.	
Repeat alignments (7) and (8) several times.							
(9)	TUNING LEVEL	(A) 1000(999)kHz 0 dev 25dBμ(ANT input)	–	1000(999)kHz	VR2	Adjust VR2 so that FL1(TUNED) goes off. Then, adjust VR4 and stop at the point where FL1(TUNED) goes on.	

※L5:T-91L only

REGLAGE

N°	ITEM	REGLAGE DE L'ENTREE	REGLAGE DE LA SORTIE	REGLAGE DU TUNER	POINT DE L'ALIGNEMENT	ALIGNER POUR	FIG.
SECTION MF	Sauf en cas d'indications spéciales, régler chaque commutateur comme suit: SELECTEUR: FM MODE: FM MODE/AUTO						
1	BORD DE BANDE (1)	–	Relier un voltmètre CC entre les TP10(VT) et TP11(GND).	87,5MHz	L7 (Contrôle)	2,5V	(a)
2	BORD DE BANDE (2)	–	Relier un voltmètre CC entre les TP10(VT) et TP11(GND).	108,0MHz	TC1 (Contrôle)	8,0V	(a)
Répéter les points 1 et 2 plusieurs fois.							
3	ALIGNEMENT HT	(A) 98,0MHz 1kHz.±75kHz dév	(B)	MONO 98,0MHz	※ L2.3.5 (Contrôle)	Amplitude et symétrie maximale de l'affichage de l'oscilloscope.	
4	DISCRIMINATEUR	(A) 98,0MHz 1kHz.±75kHz dév 60dBμ(Entrée ANT)	Relier un voltmètre CC entre les TP1 et TP2.	MONO 98,0MHz	L8	0V	(b)
5	VCO	(A) 98,0MHz 0 dév 60dBμ(Entrée ANT)	Relier une résistance de 330kΩ à TP8. Raccorder un compteur de fréquence à une résistance par l'intermédiaire d'un voltmètre CA.	98,0MHz	VR3	19,00kHz	(c)
6	DISTORSION (STEREO)	(C) 98,0MHz 1kHz.±68,25kHz dév Selection:L ou R 60dBμ(Entrée ANT)	(B)	98,0MHz	T1 (Contrôle)	Distorsion minimale. (L ou R)	
7	SEPARATION	(C) 98,0MHz 1kHz.±68,25kHz dév Selection:L ou R 60dBμ(Entrée ANT)	(B)	98,0MHz	VR4	Diaphonie minimale.	
8	NIVEAU D'ACCORDER	(A) 98,0MHz 0 dév 18dBμ(Entrée ANT)	–	98,0MHz	VR1	Ajuster VR1 que FL1(TUNED) est non allumé. Alors, ajuster VR1 et arrêter le mouvement de VR1 au moment oû le FL1(TUNED)s'allume.	
SECTION MA	Laisser l'antenne bouche MA installée. SELECTEUR:AM(T-91) ou MW(T-91L)						
(1)	BORD DE BANDE (1)	–	Relier un voltmètre CC entre les TP10(VT) et TP11(GND).	530kHz (531kHz)	L5	1,5V	(a)
(2)	BORD DE BANDE (2)	–	Relier un voltmètre CC entre les TP10(VT) et TP11(GND).	1610kHz (1602kHz)	TC4	8,0V	(a)
Répéter les points (1) et (2) plusieurs fois.							
(3)	ALIGNEMENT HT (1)	(D) 630kHz 400Hz.30% mod	(B)	630kHz	L3	Amplitude et symétrie maximale de l'affichage de l'oscilloscope.	
(4)	ALIGNEMENT HT (2)	(D) 1440kHz 400Hz.30% mod	(B)	1440kHz	TC2	Amplitude et symétrie maximale de l'affichage de l'oscilloscope.	
Répéter les points (3) et (4) plusieurs fois.							
SECTION GO(T-91L seulement)	Laisser l'antenne bouche MA installée. SELECTEUR: LW						
(5)	BORD DE BANDE (1)	–	Relier un voltmètre CC entre les TP10(VT) et TP11(GND).	153kHz	L4	1,5V	(a)
(6)	BORD DE BANDE (2)	–	Relier un voltmètre CC entre les TP10(VT) et TP11(GND).	281kHz	TC3	8,0V	(a)
Répéter les points (5) et (6) plusieurs fois.							
(7)	ALIGNEMENT HT (1)	(D) 162kHz 400Hz.30% mod	(B)	162kHz	L2	Amplitude et symétrie maximale de l'affichage de l'oscilloscope.	
(8)	ALIGNEMENT HT (2)	(D) 270kHz 400Hz.30% mod	(B)	270kHz	TC1	Amplitude et symétrie maximale de l'affichage de l'oscilloscope.	
Répéter les point (7) et (8) plusieurs fois.							
(9)	NIVEAU D'ACCORDER	(A) 1000(999)kHz 0 dév 25dBμ(Entrée ANT)	–	1000(999)kHz	VR2	Ajuster VR2 que FL1(TUNED) est non allumé. Alors, ajuster VR2 et arrêter le mouvement de VR4 au moment oû le FL1(TUNED)s'allume.	

※L5:T-91L seulement

ABGLEICH

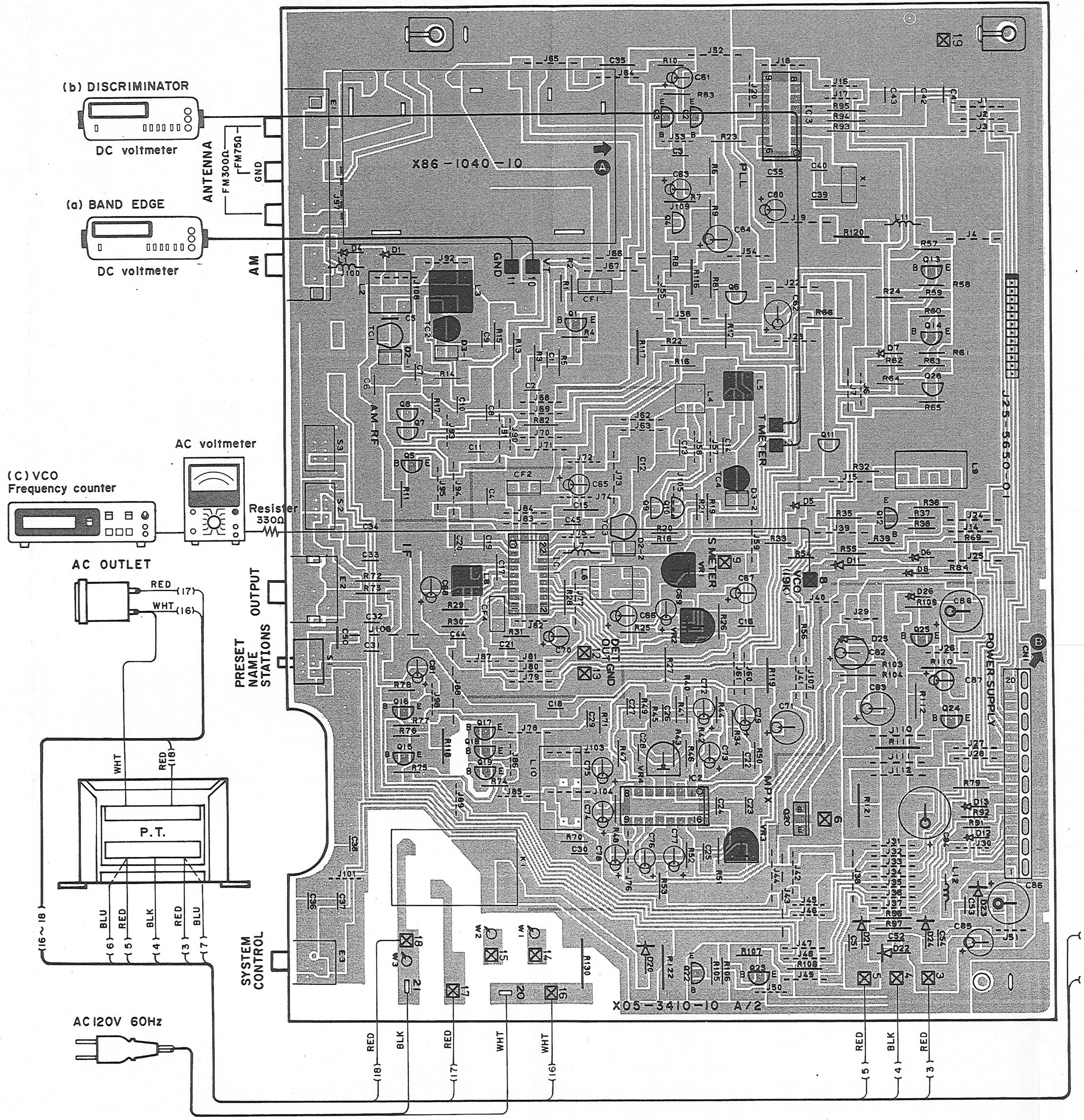
NR.	GEGENSTAND	EINGANGS-EINSTELLUNG	AUSGANGS-EINSTELLUNG	TUNER-EINSTELLUNG	ABGLEICH-PUNKTE	ABGLEICHEN FÜR	ABB.
UKW-EMPFANGSABTEILUNG	Außer wenn anders angegeben, die verschiedenen Schalter wie folgt einstellen: SELECTOR: FM MODE:FM MODE/AUTO						
1	BANDKANTE (1)	–	Einen Gleichspannungsmesser zwischen TP10(VT) und TP11(GND) anschließen.	87,5MHz	L7 (Eingangsstufe)	2,5V	(a)
2	BANDKANTE (2)	–	Einen Gleichspannungsmesser zwischen TP10(VT) und TP11(GND) anschließen.	108,0MHz	TC1 (Eingangsstufe)	8,0V	(a)
Abstimmungen 1 und 2 mehrere Male wiederholen.							
3	EMPFANGS-BEREICH-ABSTIMMUNGEN	(A) 98,0MHz 1kHz.±75kHz Hub	(B)	MONO 98,0MHz	※ L2.3.5 (Eingangsstufe)	Maximal Amplitude und Symmetrie des Oszilloskopbildes.	
4	DISKRIMINATOR	(A) 98,0MHz 1kHz.±75kHz Hub 60dBμ(ANT Eingang)	Einen Gleichspannungsmesser zwischen TP2 und TP1 anschließen.	MONO 98,0MHz	L8	0V	(b)
5	SPANNUNGS-GEREGELTER OSZILLATOR	(A) 98,0MHz 0 Hub 60dBμ(ANT Eingang)	Einen 330kΩ Widerstanden zu TP8 anschließen. Einen Frequenzzähler über einen Wechselspannungsmesser an den Widerstand anschließen.	98,0MHz	VR3	19,00kHz	(c)
6	KLIRRFACTOR (STEREO)	(C) 98,0MHz 1kHz.±68,25kHz Hub Wähler: L oder R 60dBμ(ANT-Eingang)	(B)	98,0MHz	T1 (Eingangsstufe)	Minimal Klirrfactor. (L oder R)	
7	STEREO KANAL TRENNUNG	(C) 98,0MHz 1kHz.±68,25kHz Hub Wähler: L oder R 60dBμ(ANT-Eingang)	(B)	98,0MHz	VR4	Minimal Übersprechen.	
8	ABSTIMM PEGEL	(A) 98,0MHz 0 Hub 18dBμ(ANT-Eingang)	–	98,0MHz	VR1	Den Pegel widerstand VR1 so einstellen, deß der FL1(TUNED)anzeiger nicht leuchtet. Dann der Pegel widerstand aufdrehen. und dem VR1 Halt geben wobei den FL1(TUNED) anzeiger leuchtet wird.	
MW-EMPFANGSABTEILUNG	Die MW-Rahmenantenne angebracht lassen. SELECTOR: AM(T-91) oder MW(T-91L)						
(1)	BANDKANTE (1)	–	Einen Gleichspannungsmesser zwischen TP10(VT) und TP11(GND) anschließen.	530kHz (531kHz)	L5	1,5V	(a)
(2)	BANDKANTE (2)	–	Einen Gleichspannungsmesser zwischen TP10(VT) und TP11(GND) anschließen.	1610kHz (1602kHz)	TC4	8,0V	(a)
Abstimmungen (1) und (2) mehrere Male wiederholen.							
(3)	HF-ABGLEICH (1)	(D) 630kHz 400Hz.30% mod	(B)	630kHz	L3	Maximal Amplitude und Symmetrie des Oszilloskopbildes.	
(4)	HF-ABGLEICH (2)	(D) 1440kHz 400Hz.30% mod	(B)	1440kHz	TC2	Maximal Amplitude und Symmetrie des Oszilloskopbildes.	
Abstimmungen (3) und (4) mehrere Male wiederholen.							
LW-EMPFANGSABTEILUNG(nur T-91L)	Die MW-Rahmenantenne angebracht lassen. SELECTOR: LW						
(5)	BANDKANTE (1)	–	Einen Gleichspannungsmesser zwischen TP10(VT) und TP11(GND) anschließen.	153kHz	L4	1,5V	(a)
(6)	BANDKANTE (2)	–	Einen Gleichspannungsmesser zwischen TP10(VT) und TP11(GND) anschließen.	281kHz	TC3	8,0V	(a)
Abstimmungen (5) und (6) mehrere Male wiederholen.							
(7)	HF-ABGLEICH (1)	(D) 162kHz 400Hz.30% mod	(B)	162kHz	L2	Maximal Amplitude und Symmetrie des Oszilloskopbildes.	
(8)	HF-ABGLEICH (2)	(D) 270kHz 400Hz.30% mod	(B)	270kHz	TC1	Maximal Amplitude und Symmetrie des Oszilloskopbildes.	
Abstimmungen (7) und (8) mehrere Male wiederholen.							
(9)	ABSTIMM PEGEL	(A) 1000(999)kHz 0 Hub 25dBμ(ANT-Eingang)	–	1000(999)kHz	VR2	Den Pegel widerstand VR2 so einstellen, deß der FL1(TUNED)anzeiger nicht leuchtet. Dann der Pegel widerstand aufdrehen, und dem VR2 Halt geben wobei den FL1(TUNED) anzeiger leuchtet wird.	

※L5:nur T-91L

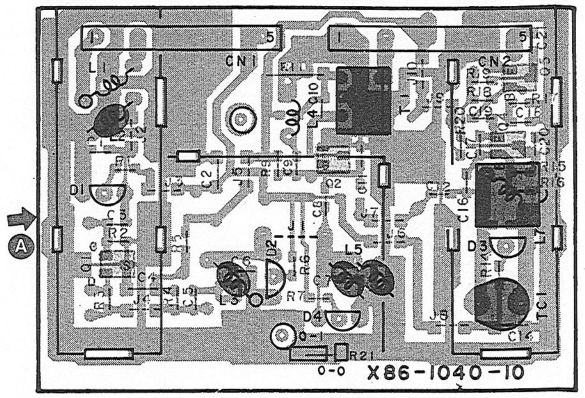
PC BOARD

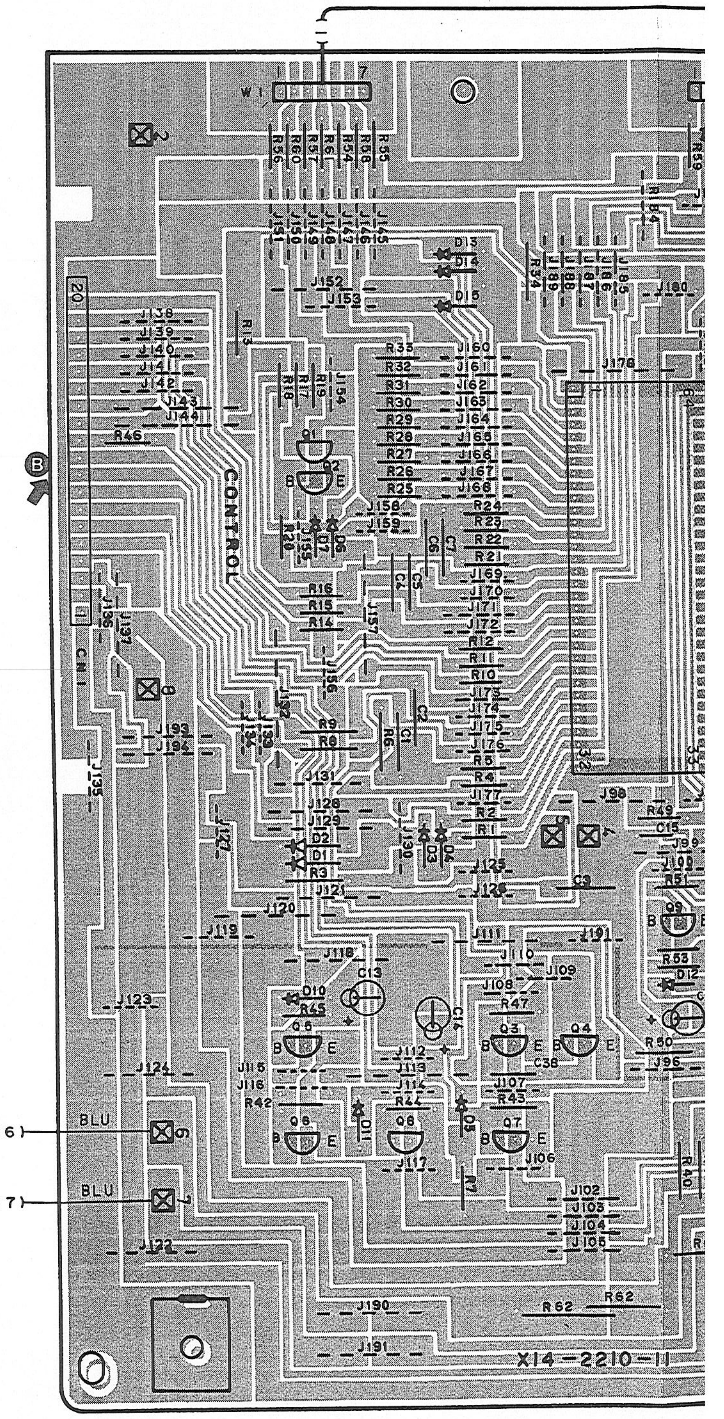
COMPONENT SIDE VIEW

TUNER UNIT (X05-3410-10)


(b) DISCRIMINATOR
DC voltmeter
(a) BAND EDGE
DC voltmeter
ANTENNA
FM300Ω
FM75Ω
GND
AM
(C) VCO
Frequency counter
AC voltmeter
Resister 330Ω
AC OUTLET
RED (17)
WHT (16)
WHT
RED (18)
P.T.
BLU (6)
RED (5)
BLK (4)
RED (3)
BLU (7)
(16~18)
AC120V 60Hz
OUTPUT
PRESET NAME STATIONS
SYSTEM CONTROL
X86-1040-10
AM-RF
IF
PLL
T.METER
S.METER
VCO
DET OUT GND
MPX
POWER SUPPLY
J25-5650-01
X05-3410-10 A/2
RED (18)
BLK
RED (17)
WHT
WHT (16)
RED (5)
BLK (4)
RED (3)

FRONT-END UNIT (X86-1040-10)

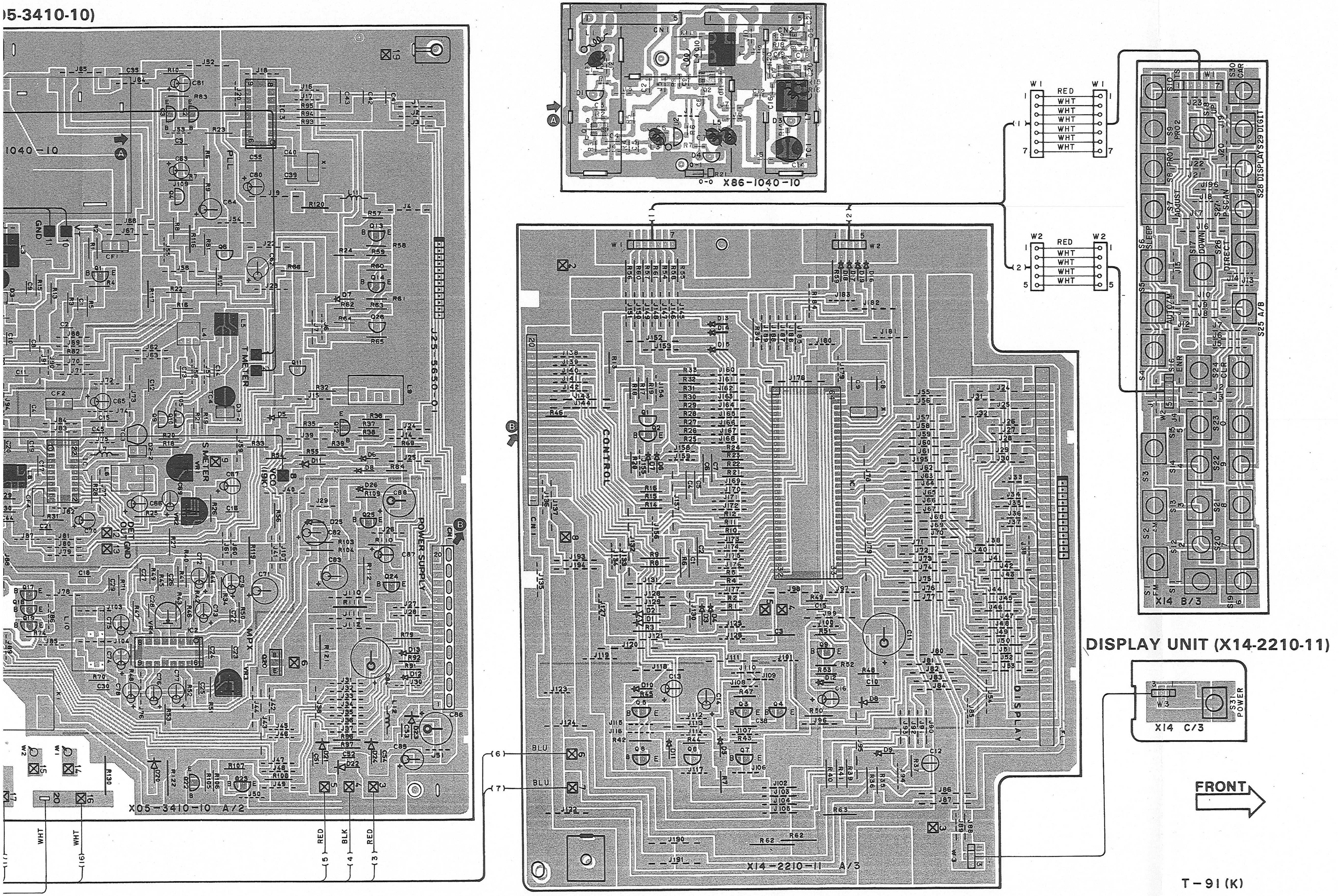

CN1
CN2
X86-1040-10


CONTROL
BLU (6)
BLU (7)
X14-2210-11

05-3410-10)

FRONT-END UNIT (X86-1040-10)

DISPLAY UNIT (X14-2210-11)


X05-3410-10 A/2
X86-1040-10
X14-2210-11 A/3
X14 B/3
X14 C/3
CONTROL
DISPLAY
POWER SUPPLY
PLL
T.METER
S.METER
VCO (19K)
MPX
DET OUT GND
J25 5650-01
W1
W2
W3
RED
WHT
BLU
BLK
S1 FM
S2 AM
S3
S4
S5 AUTO/M
S6 SLEEP
S7 ADJUST
S8 PRO1
S9 PRO2
S10 ST
S16 ENR
S17 DOWN
S18 UP
S19 6
S20 7
S21 8
S22 9
S23 0
S24 CLR
S25 A/B
S26 DIRECT
S27 P.SCAN
S28 DISPLAY
S29 DIGIT
S30 CAR
S31 POWER
FRONT

T-91(K)

Refer to the schematic diagram for the values of resistors and capacitors.

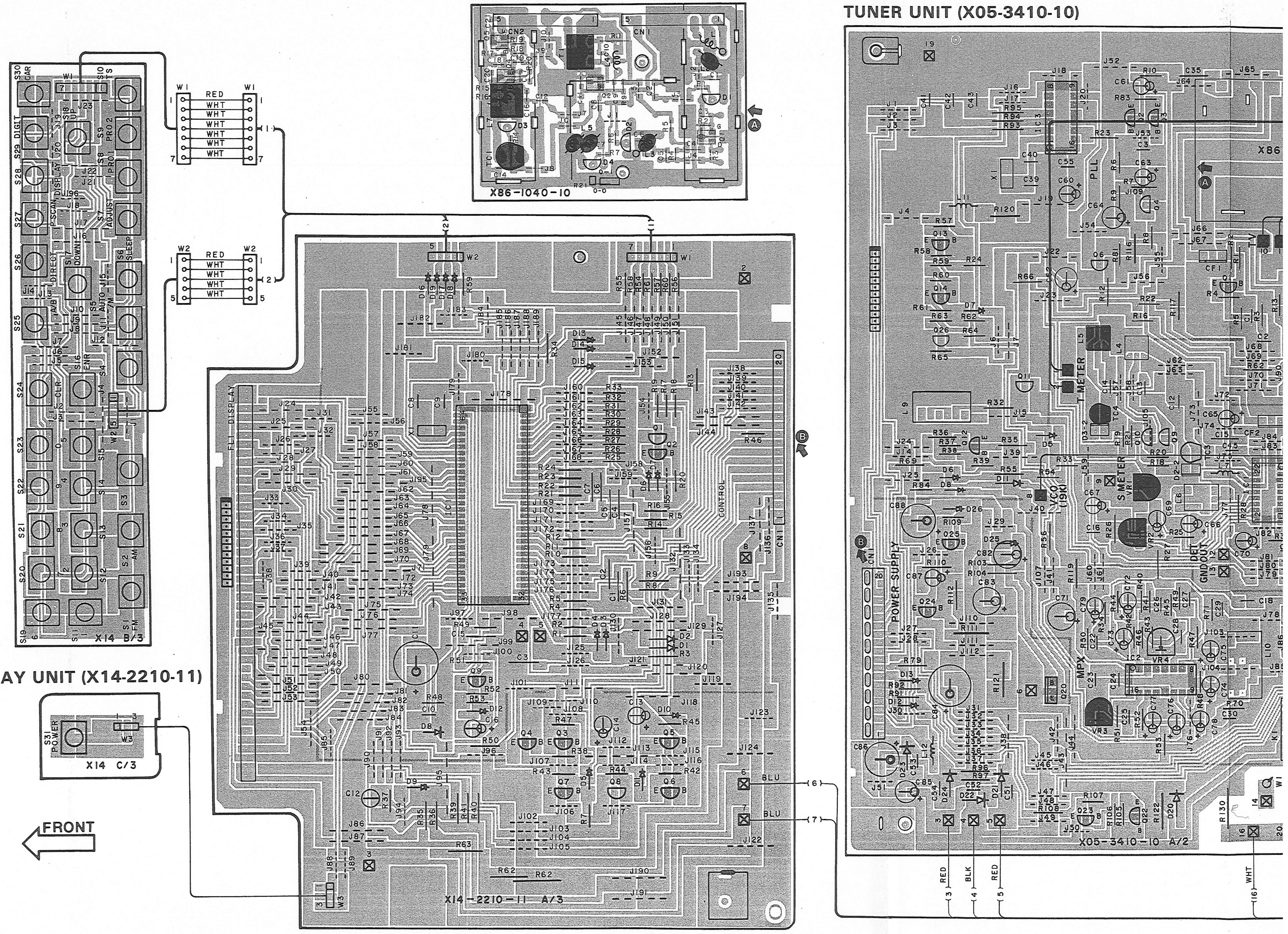
PC BOARD

FOIL SIDE VIEW

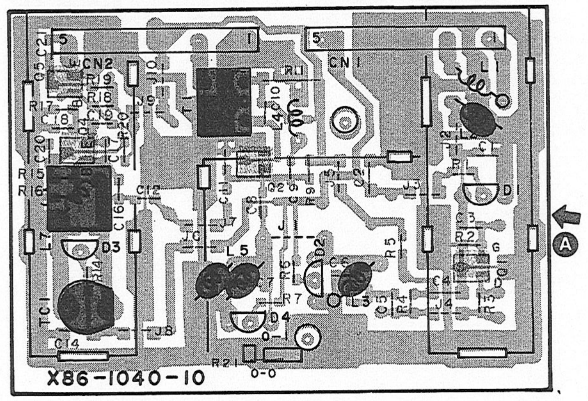
FRONT-END UNIT (X86-1040-10)

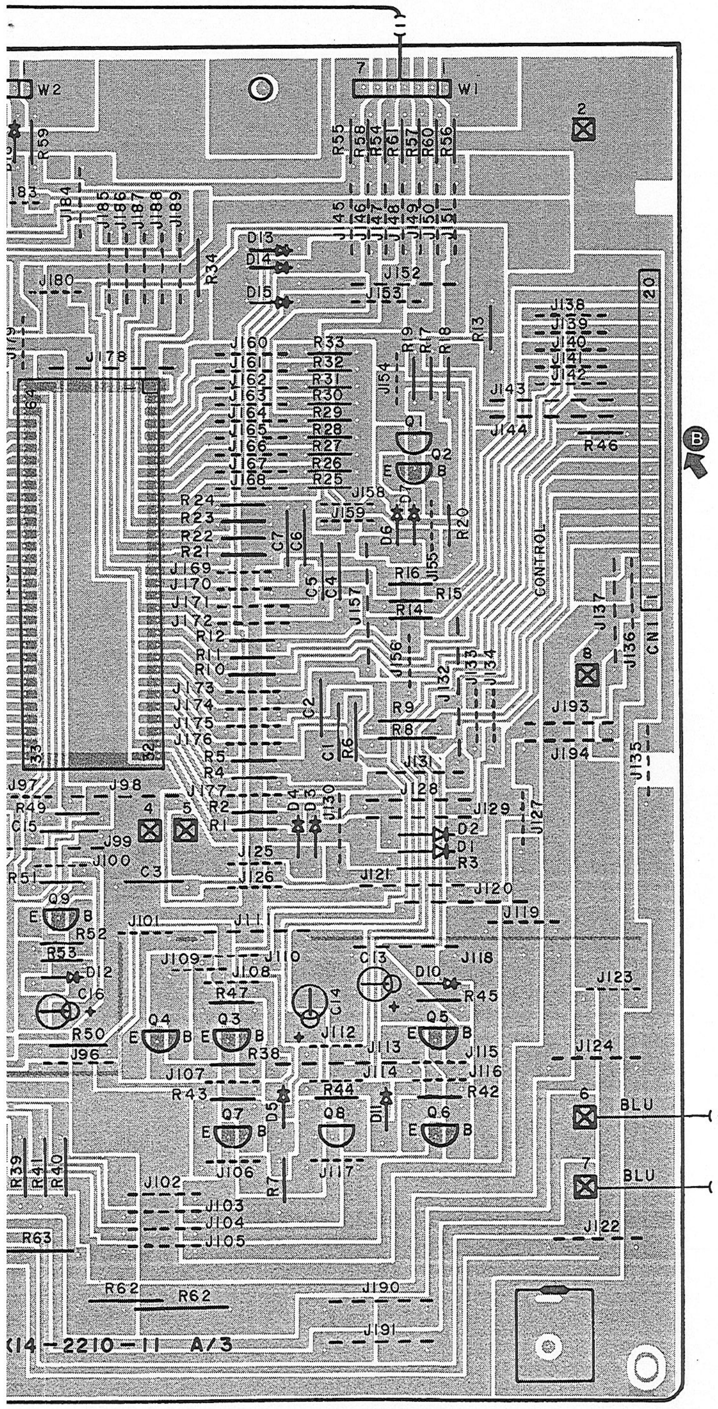
TUNER UNIT (X05-3410-10)

DISPLAY UNIT (X14-2210-11)

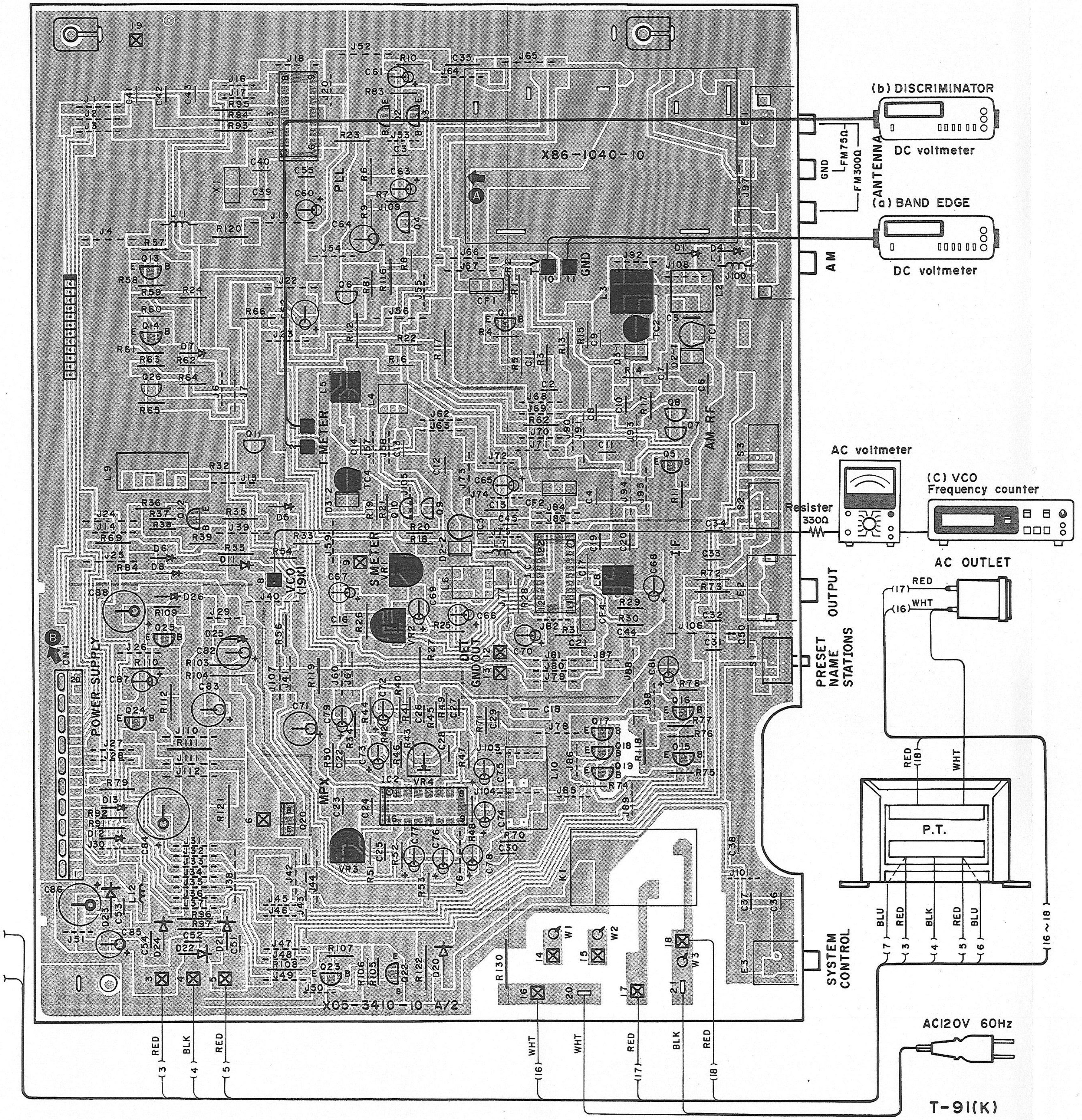

X86-1040-10
X14 B/3
X14 C/3
X14-2210-11 A/3
X05-3410-10 A/2
S31 POWER
FRONT
FL1 DISPLAY
CONTROL
CN1
POWER SUPPLY
PLL
T.METER
S.METER
VCO (19K)
MPX
DET GNDOUT
RED
WHT
BLK
BLU
W1
W2
W3
IC1
S29 DIGIT
S30 CAR
S10 TS
S9 PRO2
S8 PRO1
S7 ADJUST
S6 SLEEP
S5 AUTO
S2 AM
S1 FM
S18 UP
S16 ENR
S17 DOWN
S25
S24 CLR
S23
S22
S21
S20
S19
S28
S27 P.SCAN
S26 DIRECT

FRONT-END UNIT (X86-1040-10)


X86-1040-10
CN1
CN2
L5
TC1
D3
A


W1
W2
CONTROL
CN1
B
X14-2210-11 A/3

TUNER UNIT (X05-3410-10)

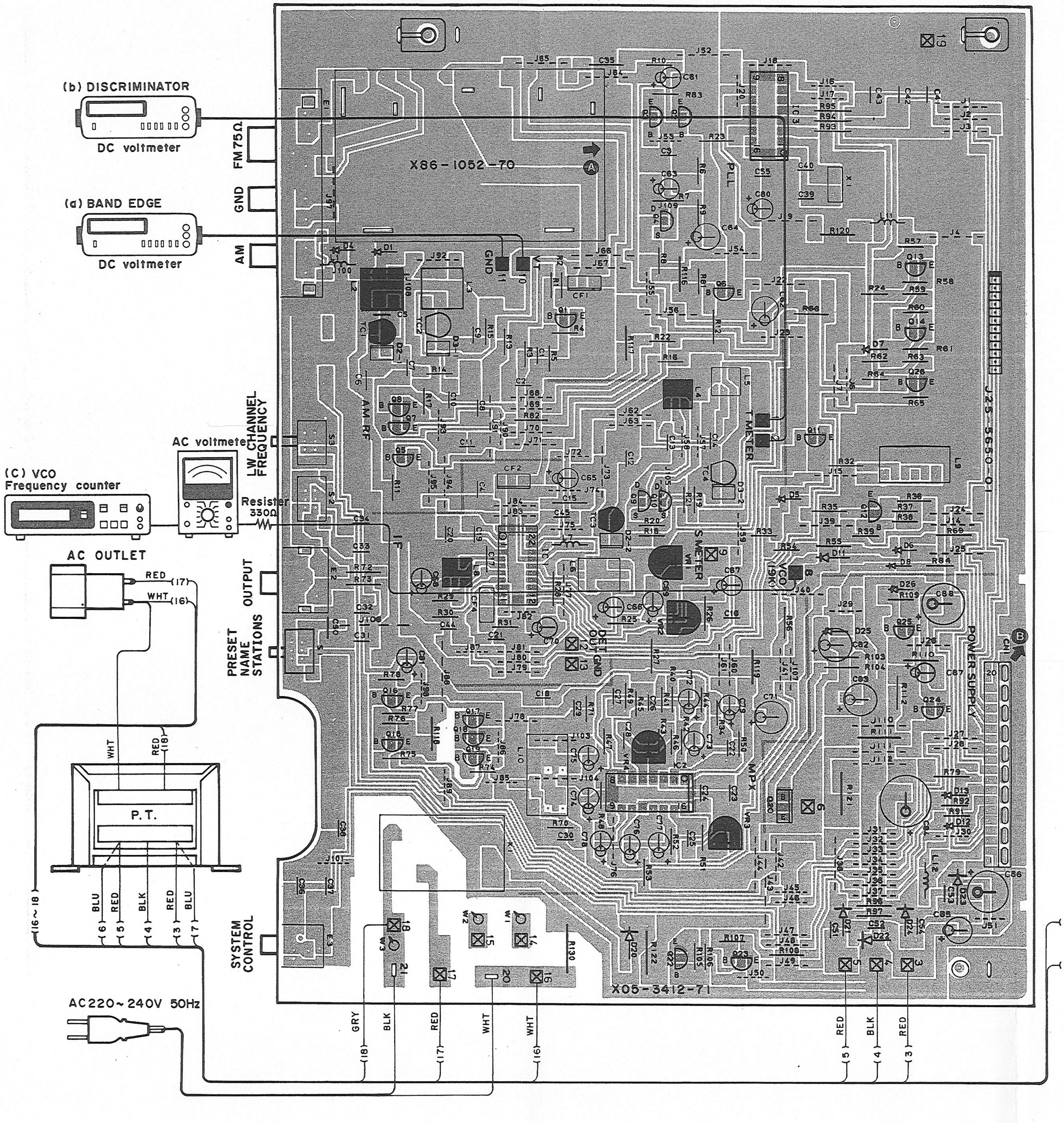

X86-1040-10
(b) DISCRIMINATOR
DC voltmeter
(a) BAND EDGE
DC voltmeter
ANTENNA
GND
FM75Ω
FM300Ω
AM
AC voltmeter
(C) VCO
Frequency counter
Resister
330Ω
AC OUTLET
RED
WHT
OUTPUT
PRESET NAME STATIONS
SYSTEM CONTROL
P.T.
BLU
RED
BLK
RED
BLU
AC120V 60Hz
POWER SUPPLY
MPX
PLL
T-METER
S-METER
VCO (19K)
DET OUT
AM RF
IF
VR1
VR2
VR3
VR4
IC2
X05-3410-10 A/2
T-91(K)

Refer to the schematic diagram for the values of resistors and capacitors.

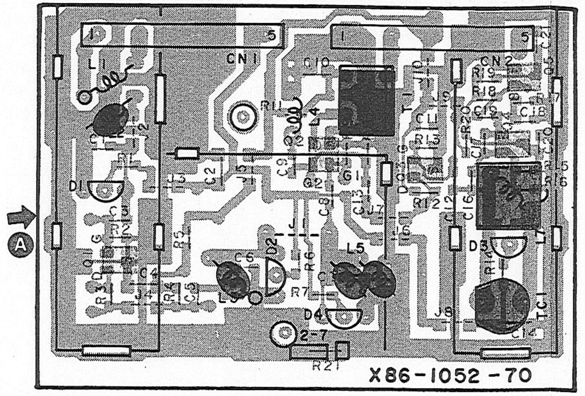
PC BOARD

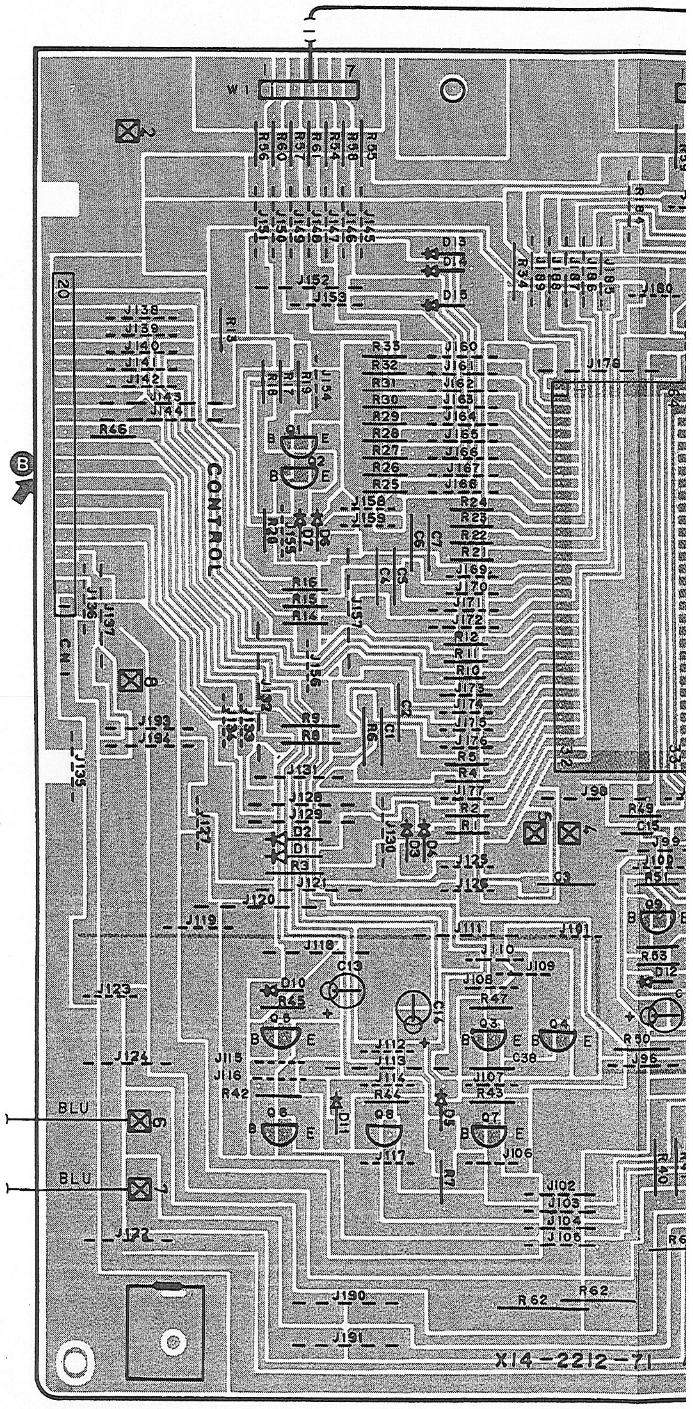
COMPONENT SIDE VIEW

TUNER UNIT (X05-3412-71)

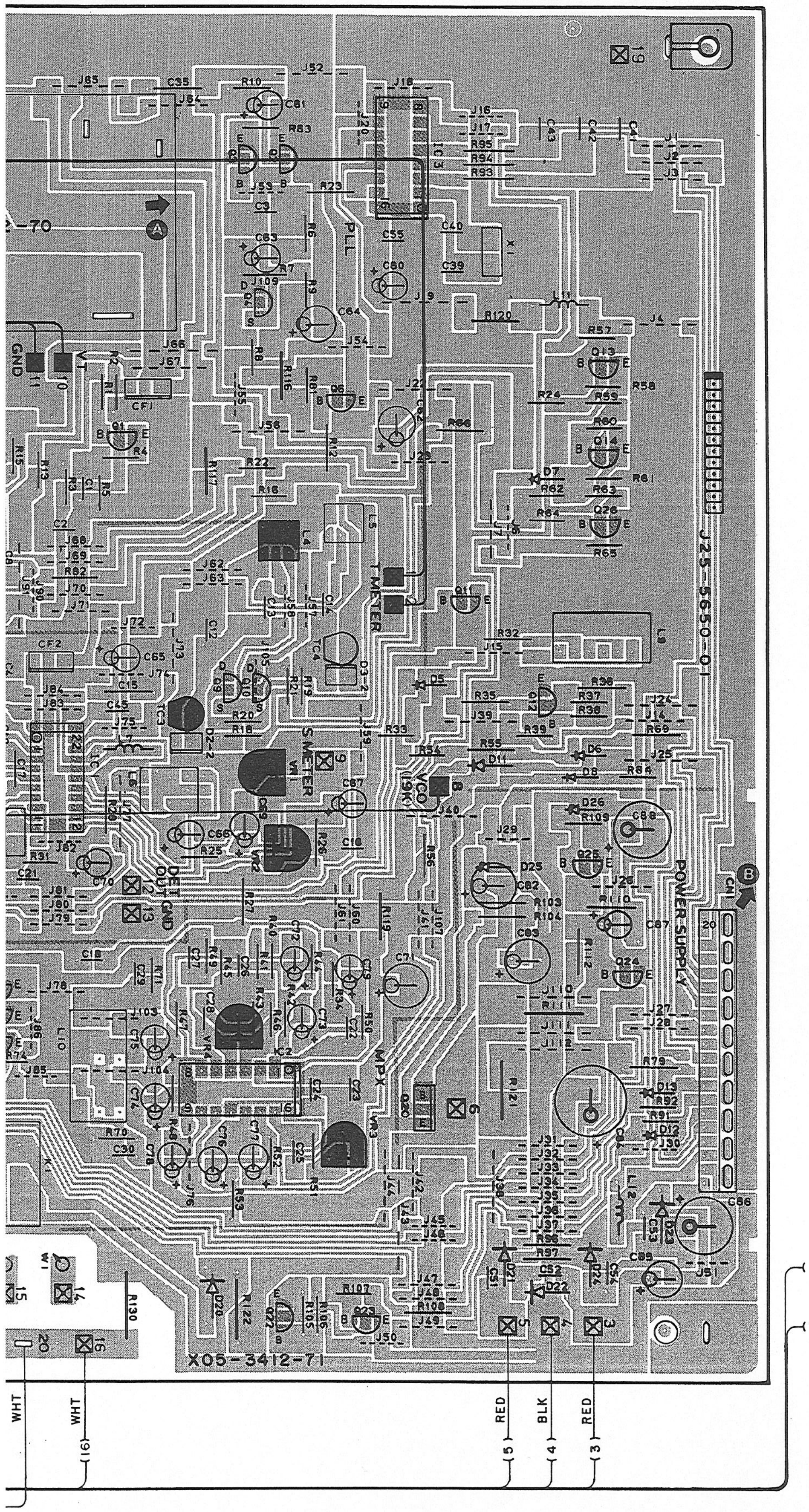

(b) DISCRIMINATOR
DC voltmeter
(d) BAND EDGE
DC voltmeter
(C) VCO
Frequency counter
AC voltmeter
Resister
330Ω
AC OUTLET
RED
WHT
(17)
(16)
P.T.
WHT
RED (18)
BLU
RED
BLK
RED
BLU
(6)
(5)
(4)
(3)
(7)
(16~18)
AC220~240V 50Hz
FM75Ω
GND
AM
LW CHANNEL FREQUENCY
OUTPUT
PRESET NAME STATIONS
SYSTEM CONTROL
X86-1052-70
AM RF
PLL
T METER
S METER
DET OUT GND
MPX
POWER SUPPLY
J25-5650-01
GRY
BLK
RED
WHT
WHT
(18)
(17)
(16)
RED
BLK
RED
(5)
(4)
(3)
(6)
(7)
X05-3412-71

FRONT-END UNIT (X86-1052-70)

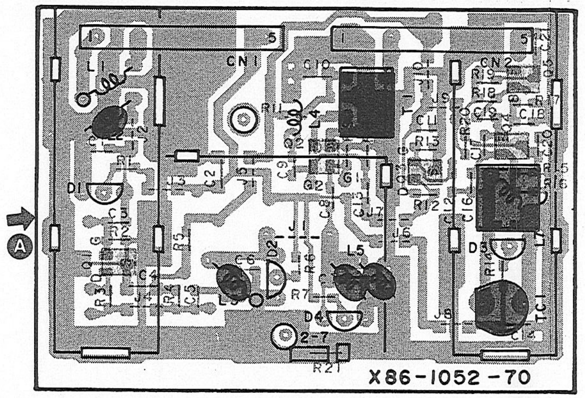

CN1
X86-1052-70

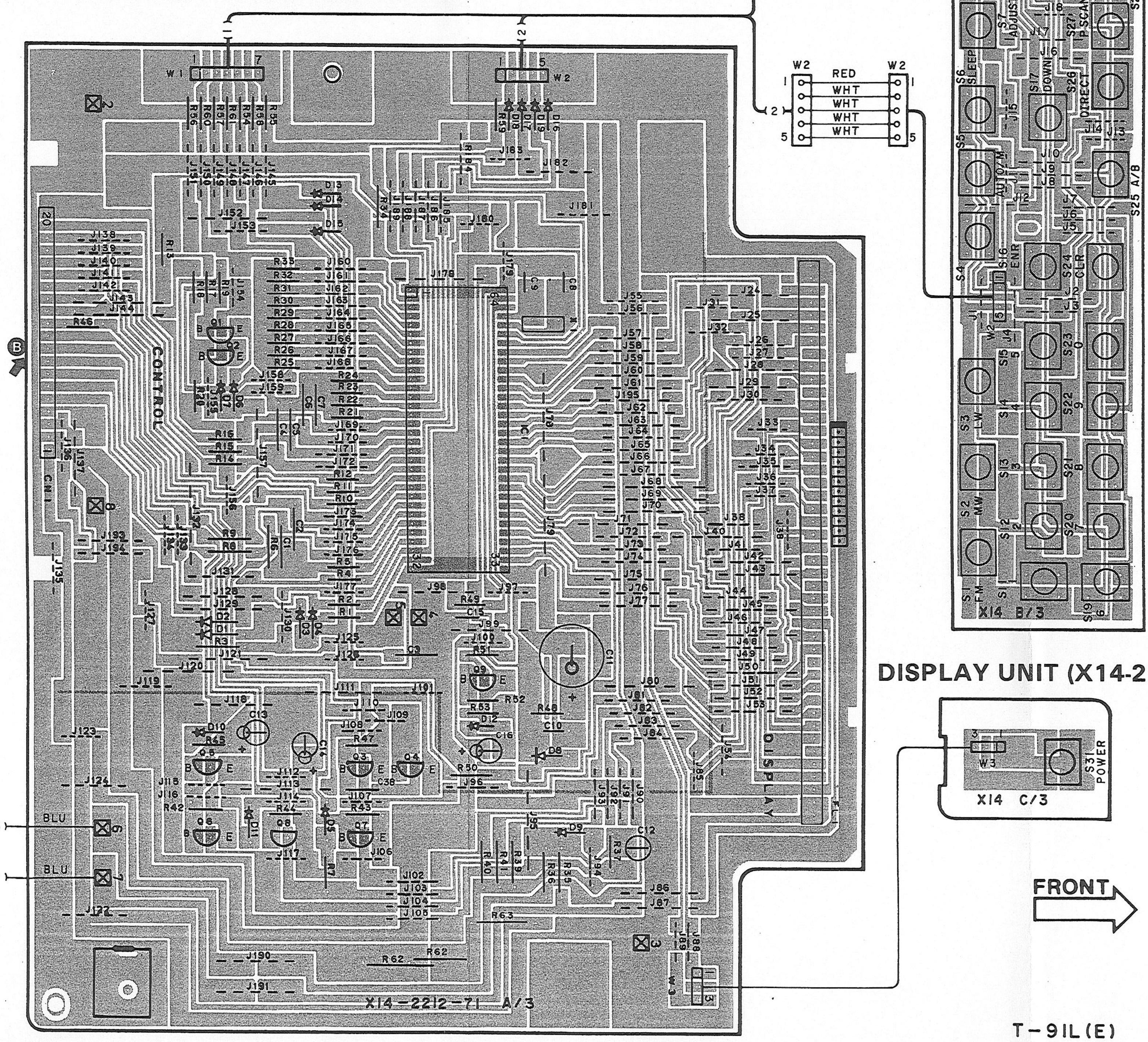

W1
CONTROL
BLU
BLU
(6)
(7)
X14-2212-71

412-71)


X05-3412-71
J25-5650-01
PLL
T.METER
S.METER
MPX
POWER SUPPLY
DET OUT
GND
WHT
RED
BLK
(3)
(4)
(5)
(6)

FRONT-END UNIT (X86-1052-70)


X86-1052-70
CN1
CN2
TC1


W1
W2
RED
WHT
BLU
(6)
(7)
CONTROL
DISPLAY
X14-2212-71 A/3
X14 B/3
X14 C/3
S1 FM
S2 MW
S3 LW
S4
S5
S6 SLEEP
S7 ADJUST
S8 PRO1
S9 PRO2
S10
S17 DOWN
S18 UP
S25 A/B
S26 DIRECT
S27 P.SCAN
S28 DISPLAY
S29 DIGIT
S30 CAR
S31 POWER

DISPLAY UNIT (X14-2212-71)

FRONT

T−9IL(E)

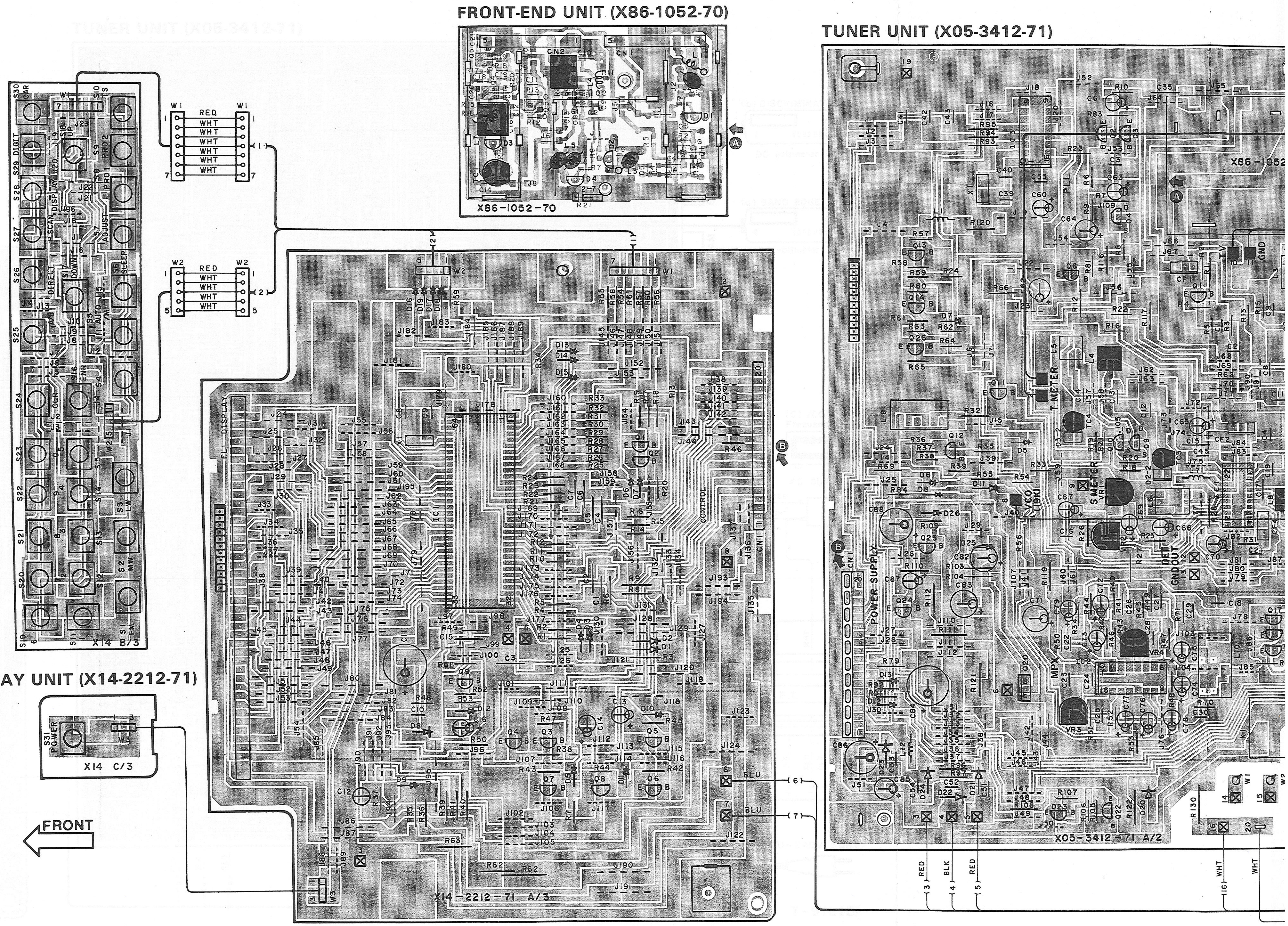
Refer to the schematic diagram for the values of resistors and capacitors.

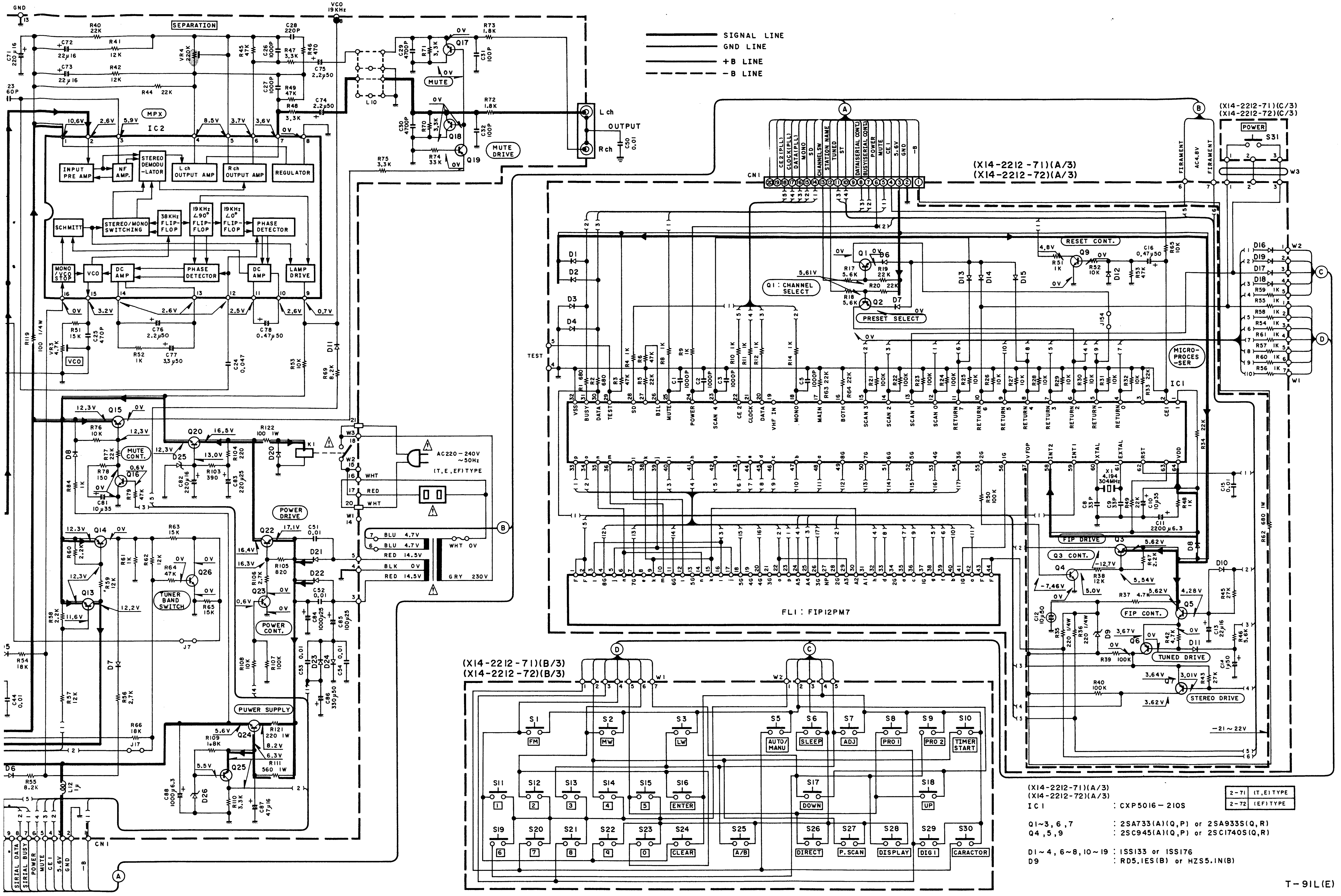
PC BOARD
FOIL SIDE VIEW

FRONT-END UNIT (X86-1052-70)

TUNER UNIT (X05-3412-71)

DISPLAY UNIT (X14-2212-71)


X86-1052-70
CN1
CN2
X05-3412-71 A/2
X86-1052
PLL
T METER
S METER
MPX
DET GND OUT
GND
POWER SUPPLY
X14-2212-71 A/3
CONTROL
FL DISPLAY
X14 B/3
X14 C/3
S31 POWER
S30 CAR
S29 DIGIT
S28 DISPLAY
S27 P.SCAN
S26 DIREC
S25 A/B
S24 CLR
S10 S
S9 PRO2
S8 PRO1
S7 ADJUST
S6 SLEEP
S5 AUTO
S3 LW
S2 MW
S1 FM
W1
W2
W3
RED
WHT
BLU
BLK
FRONT


SIGNAL LINE
GND LINE
+B LINE
−B LINE
GND
VCO 19KHz
SEPARATION
MPX
IC2
INPUT PRE AMP
NF AMP.
STEREO DEMODU-LATOR
L ch OUTPUT AMP
R ch OUTPUT AMP
REGULATOR
SCHMITT
STEREO/MONO SWITCHING
38KHz FLIP-FLOP
19KHz ∠90° FLIP-FLOP
19KHz ∠0° FLIP-FLOP
PHASE DETECTOR
MONO /VCO STOP
VCO
DC AMP
LAMP DRIVE
MUTE
MUTE DRIVE
L10
L ch
OUTPUT
R ch
MUTE CONT.
TUNER BAND SWITCH
POWER DRIVE
POWER CONT.
POWER SUPPLY
AC220−240V ~50Hz
(T,E,EF)TYPE
WHT
RED
BLU 4.7V
BLK 0V
RED 14.5V
GRY 230V
CN1
(X14-2212-71)(A/3)
(X14-2212-72)(A/3)
(X14-2212-71)(C/3)
(X14-2212-72)(C/3)
POWER
S31
W3
FIRAMENT
AC4.8V
RESET CONT.
Q1: CHANNEL SELECT
PRESET SELECT
MICRO-PROCES-SER
IC1
TEST
FL1 : FIP12PM7
FIP DRIVE
Q3 CONT.
FIP CONT.
TUNED DRIVE
STEREO DRIVE
−21 ~ 22V
(X14-2212-71)(B/3)
(X14-2212-72)(B/3)
S1 FM
S2 MW
S3 LW
S5 AUTO/MANU
S6 SLEEP
S7 ADJ
S8 PRO1
S9 PRO2
S10 TIMER START
S11 1
S12 2
S13 3
S14 4
S15 5
S16 ENTER
S17 DOWN
S18 UP
S19 6
S20 7
S21 8
S22 9
S23 0
S24 CLEAR
S25 A/B
S26 DIRECT
S27 P.SCAN
S28 DISPLAY
S29 DIGI
S30 CARACTOR
SIRIAL DATA
SIRIAL BUSY
POWER
MUTE
CE1
5.6V
GND
−8

(X14-2212-71)(A/3)
(X14-2212-72)(A/3)

2−71	(T,E) TYPE
2−72	(EF) TYPE

IC1 : CXP5016−210S

Q1~3, 6, 7 : 2SA733(A)(Q,P) or 2SA933S(Q,R)
Q4, 5, 9 : 2SC945(A)(Q,P) or 2SC1740S(Q,R)

D1~4, 6~8, 10~19 : 1SS133 or 1SS176
D9 : RD5.1ES(B) or HZS5.1N(B)

T−91L(E)

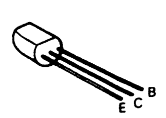
CAUTION: For continued safety, replace safety critical components only with manufacture's recommended parts (refer to parts list). ⚠ Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

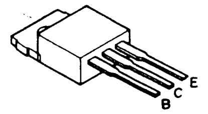
DC voltages are as measured with a high impedance voltmeter during reception of the FM broadcast signal (with a signal strength of 60 dB at the ANT terminal). Values may vary slightly due to variations between individual instruments or/and units.

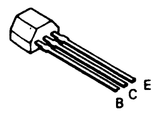
Les tensinos c.c. doivent être mesurées avec un voltmètre à haute impédance pendant la réception d'un signal de programme FM (avec une force de signal de 60 dB à la dorne ANT). Les valeurs peuvent différer légèrement du fait des variations inhérentes aux appareils et aux instruments de mesure individuels.

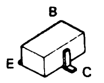
Die angegebenen Gleichspannungswerte wurden mit einem hochohmigen Spannungsmesser bei Empfang eines UKW-Signals (mit einer Feldstärke von 60 dB am Antennenanschluß) gemessen. Dabei schwanken die Meßwerte aufgrund von Unterschieden zwischen einzelnen Instrumenten oder Geräten u. U. geringfügig.

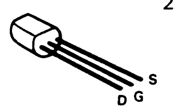
T-91L
KENWOOD

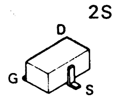

JA101
JC501
2SA733(A)
2SA999
2SC1845
2SC1923
2SC2003
2SC945(A)
2SD1302

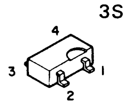

2SD1266

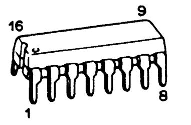

2SA933S
2SC1740S

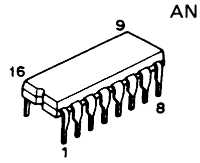

2SC2714

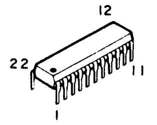

2SK364

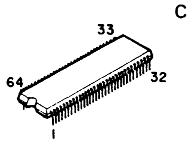

2SK302

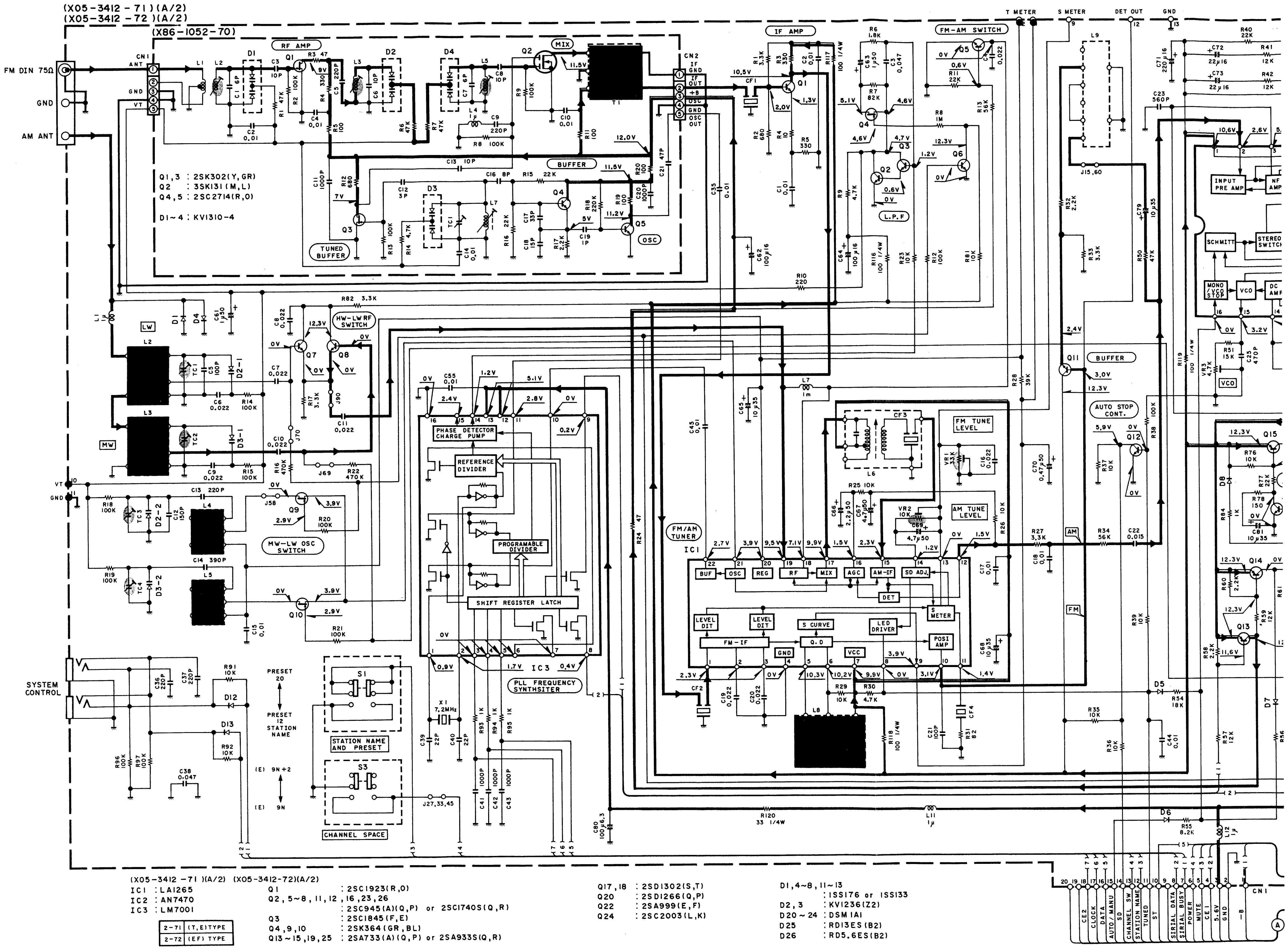

3SK131


LM7001


AN7470


LA1265


CXP5016-210S


(X05-3412 - 71)(A/2)
(X05-3412 - 72)(A/2)
(X86-1052-70)
FM DIN 75Ω
GND
AM ANT
CN1
ANT
GND
VT
RF AMP
MIX
BUFFER
TUNED BUFFER
OSC
Q1,3 : 2SK302(Y,GR)
Q2 : 3SK131(M,L)
Q4,5 : 2SC2714(R,O)
D1~4 : KV1310-4
CN2
IF GND
IF OUT
+B
OSC GND
OSC OUT
IF AMP
FM-AM SWITCH
L.P.F
T METER
S METER
DET OUT
GND
BUFFER
AUTO STOP CONT.
INPUT PRE AMP
SCHMITT
STEREO SWITCH
MONO /VCO STOP
VCO
DC AMP
LW
MW
HW-LW RF SWITCH
MW-LW OSC SWITCH
PHASE DETECTOR CHARGE PUMP
REFERENCE DIVIDER
PROGRAMABLE DIVIDER
SHIFT REGISTER LATCH
IC3
PLL FREQUENCY SYNTHSITER
X1 7.2MHz
FM/AM TUNER
IC1
BUF
OSC
REG
RF
MIX
AGC
AM-IF
SD ADJ
DET
S METER
LEVEL DIT
FM-IF
S CURVE
Q.D
LED DRIVER
POSI AMP
GND
VCC
FM TUNE LEVEL
AM TUNE LEVEL
SYSTEM CONTROL
PRESET 20
PRESET 12 STATION NAME
(E) 9N+2
(E) 9N
STATION NAME AND PRESET
S1
S3
CHANNEL SPACE
J27,33,45
CN1
CE2
CLOCK
DATA
AUTO/MANU
SD
CHANNEL SW
STATION NAME
TUNED
ST
SIRIAL DATA
SIRIAL BUSY
POWER
MUTE
CE1
5.6V
GND
-B

(X05-3412 -71)(A/2) (X05-3412-72)(A/2)

IC1 : LA1265
IC2 : AN7470
IC3 : LM7001

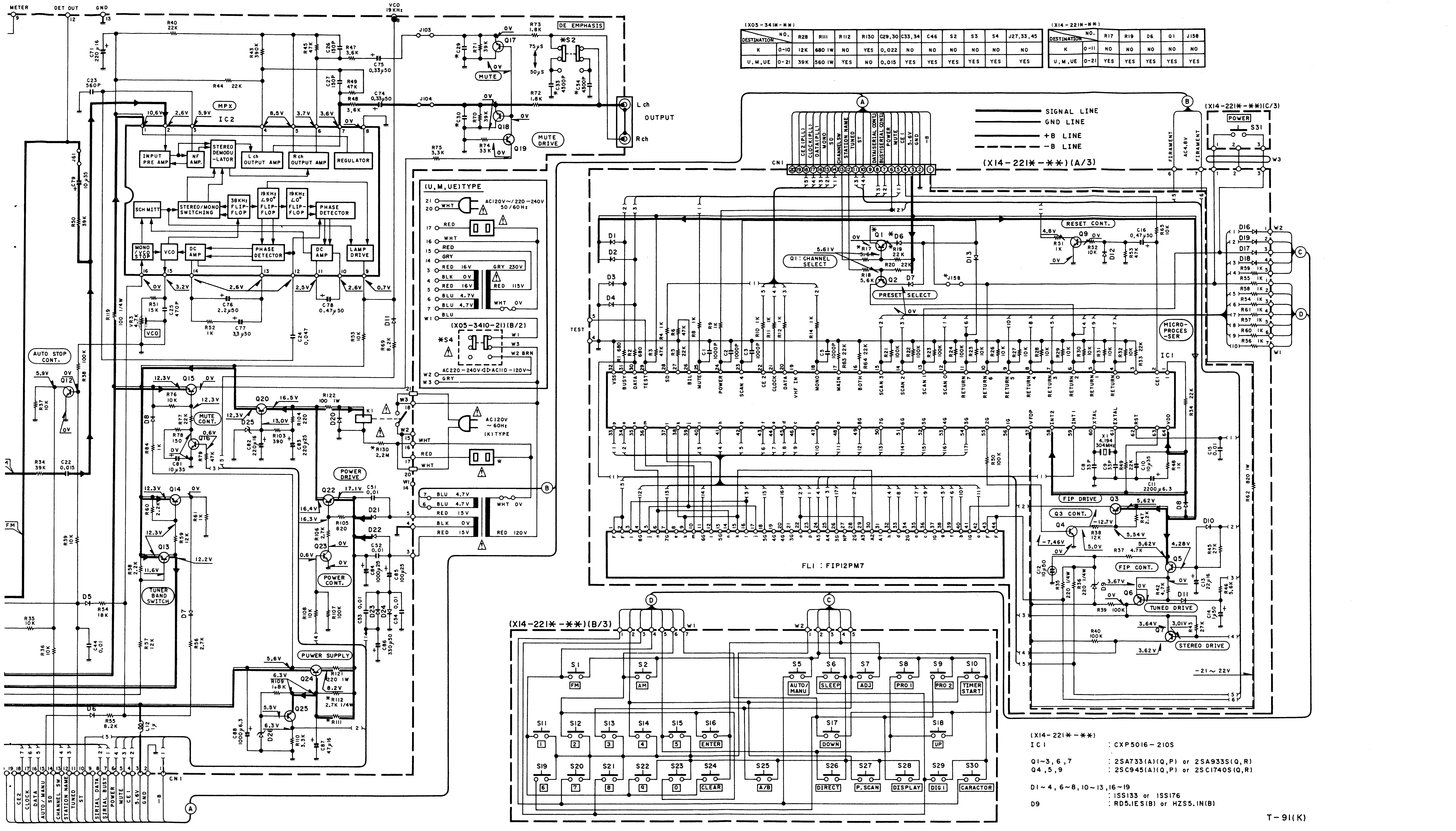
Q1 : 2SC1923(R,O)
Q2,5~8,11,12,16,23,26 : 2SC945(A)(Q,P) or 2SC1740S(Q,R)
Q3 : 2SC1845(F,E)
Q4,9,10 : 2SK364(GR,BL)
Q13~15,19,25 : 2SA733(A)(Q,P) or 2SA933S(Q,R)

2-71	(T,E)TYPE
2-72	(EF) TYPE

Q17,18 : 2SD1302(S,T)
Q20 : 2SD1266(Q,P)
Q22 : 2SA999(E,F)
Q24 : 2SC2003(L,K)

D1,4~8,11~13 : 1SS176 or 1SS133
D2,3 : KV1236(Z2)
D20~24 : DSM1A1
D25 : RD13ES(B2)
D26 : RD5.6ES(B2)

CAUTION: F
nents only wi
list). ⚠ Indic
of electric sh
shall be carri
the supply c
customer.


METER
DET OUT
GND
VCO 19KHz
DE EMPHASIS
MPX
IC2
INPUT PRE AMP
NF AMP.
STEREO DEMODU-LATOR
L ch OUTPUT AMP
R ch OUTPUT AMP
REGULATOR
SCHMITT
STEREO/MONO SWITCHING
38KHz FLIP-FLOP
19KHz ∠90° FLIP-FLOP
19KHz ∠0° FLIP-FLOP
PHASE DETECTOR
MONO /VCO STOP
VCO
DC AMP
PHASE DETECTOR
DC AMP
LAMP DRIVE
MUTE
MUTE DRIVE
L ch
OUTPUT
R ch
AUTO STOP CONT.
MUTE CONT.
POWER DRIVE
POWER CONT.
TUNER BAND SWITCH
PUWER SUPPLY
(U,M,UE)TYPE
AC120V~/220-240V 50/60Hz
(X05-3410-21)(B/2)
AC220-240V◁▷AC110-120V~
AC120V ~60Hz (K)TYPE
SIGNAL LINE
GND LINE
+B LINE
-B LINE
(X14-221*-**)(A/3)
(X14-221*-**)(C/3)
(X14-221*-**)(B/3)
POWER
FIRAMENT
AC4.8V
RESET CONT.
Q1 : CHANNEL SELECT
PRESET SELECT
MICRO-PROCES-SER
IC1
FIP DRIVE
Q3 CONT.
FIP CONT.
TUNED DRIVE
STEREO DRIVE
FL1 : FIP12PM7
S1 FM
S2 AM
S5 AUTO/MANU
S6 SLEEP
S7 ADJ
S8 PRO 1
S9 PRO 2
S10 TIMER START
S11 1
S12 2
S13 3
S14 4
S15 5
S16 ENTER
S17 DOWN
S18 UP
S19 6
S20 7
S21 8
S22 9
S23 0
S24 CLEAR
S25 A/B
S26 DIRECT
S27 P. SCAN
S28 DISPLAY
S29 DIG I
S30 CARACTOR
CN1
CE2 CLOCK DATA AUTO/MANU SD CHANNEL SW STATION NAME TUNED ST SIRIAL DATA SIRIAL BUSY POWER MUTE CE1 5.6V GND -8

(X05-341*-**)

DESTINATION		R28	R111	R112	R130	C29,30	C33,34	C46	S2	S3	S4	J27,33,45
K	0-10	12K	680 1W	NO	YES	0.022	NO	NO	NO	NO	NO	NO
U,M,UE	0-21	39K	560 1W	YES	NO	0.015	YES	YES	YES	YES	YES	YES

(X14-221*-**)

DESTINATION		R17	R19	D6	Q1	J158
K	0-11	NO	NO	NO	NO	NO
U,M,UE	0-21	YES	YES	YES	YES	YES

(X14-221*-**)

IC1	: CXP5016-210S
Q1~3, 6, 7	: 2SA733(A)(Q,P) or 2SA933S(Q,R)
Q4, 5, 9	: 2SC945(A)(Q,P) or 2SC1740S(Q,R)
D1~4, 6~8, 10~13, 16~19	: 1SS133 or 1SS176
D9	: RD5.1ES(B) or HZS5.1N(B)

T-91(K)

CAUTION: For continued safety, replace safety critical components only with manufacture's recommended parts (refer to parts list). ⚠ Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

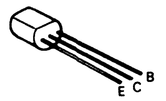
DC voltages are as measured with a high impedance voltmeter during reception of the FM broadcast signal (with a signal strength of 60 dB at the ANT terminal). Values may vary slightly due to variations between individual instruments or/and units.

Les tensinos c.c. doivent être mesurées avec un voltmètre à haute impédance pendant la réception d'un signal de programme FM (avec une force de signal de 60 dB à la dorne ANT). Les valeurs peuvent différer légèrement du fait des variations inhérentes aux appareils et aux instruments de mesure individuels.

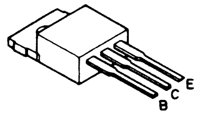
Die angegebenen Gleichspannungswerte wurden mit einem hochohmigen Spannungsmesser bei Empfang eines UKW-Signals (mit einer Feldstärke von 60 dB am Antennenanschluß) gemessen. Dabei schwanken die Meßwerte aufgrund von Unterschieden zwischen einzelnen Instrumenten oder Geräten u. U. geringfügig.

T-91
KENWOOD

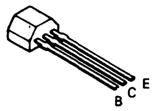
JA101
JC501
2SA733(A)
2SA999
2SC1845
2SC1923
2SC2003
2SC945(A)
2SD1302



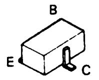
2SD1266



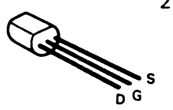
2SA933S
2SC1740S



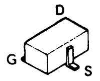
2SC2714



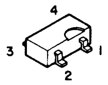
2SK364



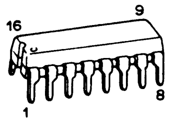
2SK302



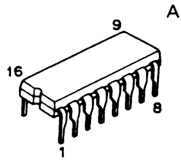
3SK131



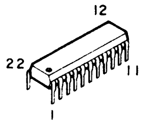
LM7001



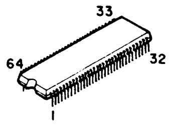
AN7470

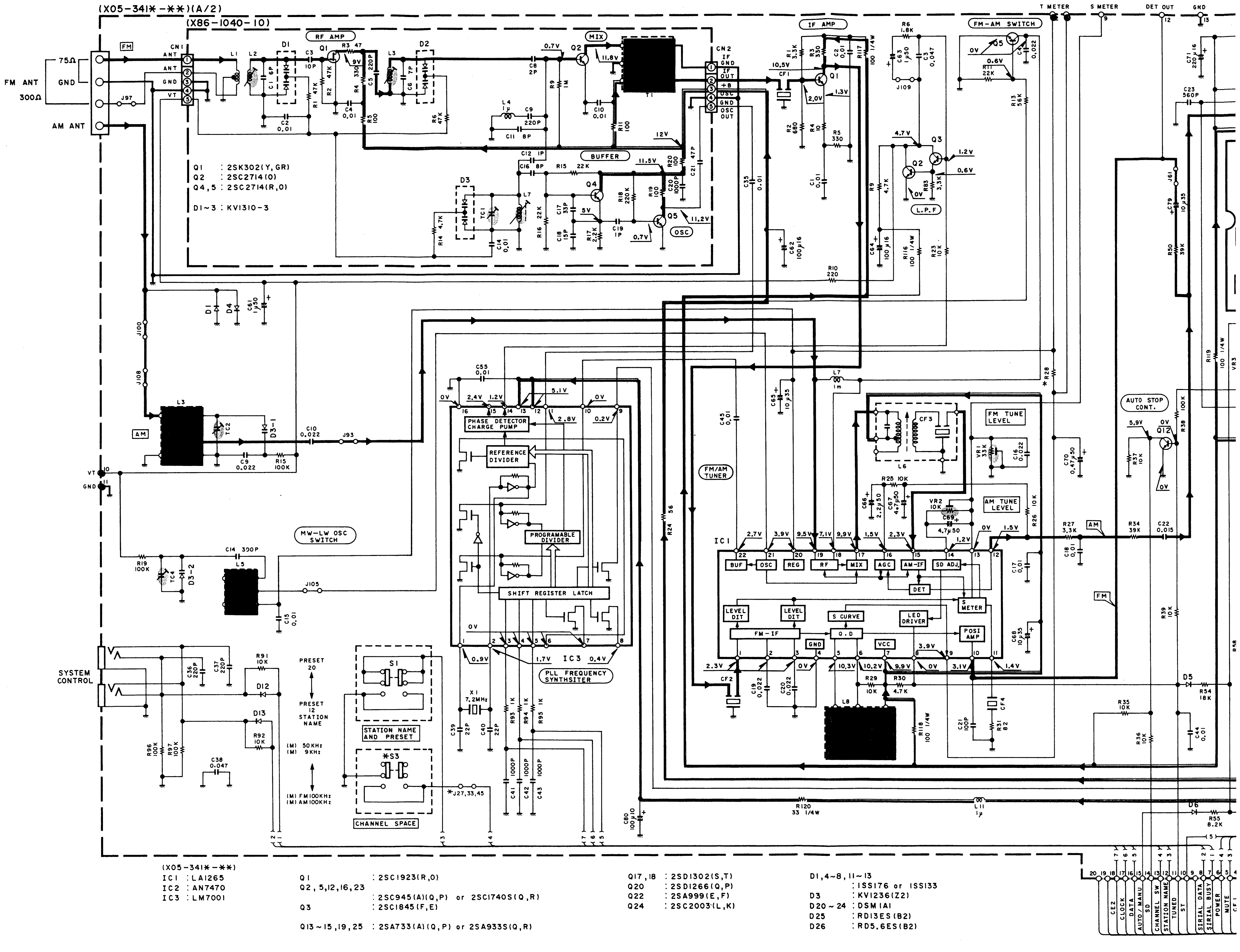


LA1265



CXP5016-210S




(X05-341✱-✱✱)(A/2)
(X86-1040-10)
FM ANT
75Ω
GND
300Ω
AM ANT
FM
CN1
ANT
ANT
GND
GND
VT
J97
RF AMP
L1
L2
D1
C3 10P
R3 47
Q1
9V
R4 330
C5 220P
L3
D2
C6 7P
C1 6P
C2 0.01
R1 47K
R2 47K
C4 0.01
R5 100
R6 47K
C8 2P
0.7V
Q2
MIX
11.8V
R9 1M
C10 0.01
R11 100
T1
L4 1μ
C9 220P
C11 8P
CN2
IF GND
IF OUT
+B
OSC
GND
OSC OUT
12V
C12 1P
BUFFER
C16 8P
R15 22K
11.5V
R20 100
C20 100P
C21 47P
Q4
R18 220K
R19 100
Q5
11.2V
OSC
D3
L7
TC1
R14 4.7K
C14 0.01
R16 22K
C17 33P
5V
C18 15P
R17 2.2K
C19 1P
0.7V
Q1 : 2SK302(Y,GR)
Q2 : 2SC2714(O)
Q4,5 : 2SC2714(R,O)
D1~3 : KV1310-3
C35 0.01
IF AMP
10.5V
CF1
R1 3.3K
R3 330
C2 0.01
R117 100 1/4W
Q1
2.0V
1.3V
R2 680
R4 10
R5 330
C1 0.01
C62 100μ16
R10 220
R6 1.8K
C63 1μ50
C3 0.047
J109
4.7V
Q3
Q2
1.2V
0.6V
0V
R83 3.3K
L.P.F
R9 4.7K
C64 100μ16
R116 100 1/4W
R23 10K
FM-AM SWITCH
0V
Q5
0.6V
R11 22K
C4 0.022
R13 56K
T METER
S METER
DET OUT
GND
9
12
13
C71 22μ16
C23 560P
J61
C79 10μ35
R50 39K
R119 100 1/4W
VR3
D1
D4
C61 1μ50
J100
J108
L3
AM
TC2
D3-1
C10 0.022
J93
C9 0.022
R15 100K
VT 10
GND 11
MW-LW OSC SWITCH
R19 100K
TC4
D3-2
C14 300P
L5
J105
C15 0.01
C55 0.01
2.4V
1.2V
5.1V
0V
0V
16
15
14
13
12
11
10
9
2.8V
0.2V
PHASE DETECTOR CHARGE PUMP
REFERENCE DIVIDER
PROGRAMABLE DIVIDER
SHIFT REGISTER LATCH
0V
1
2
3
4
5
6
7
8
0.9V
1.7V
IC3
0.4V
PLL FREQUENCY SYNTHSITER
X1 7.2MHz
C39 22P
C40 22P
R93 1K
R94 1K
R95 1K
C41 1000P
C42 1000P
C43 1000P
R24 56
C45 0.01
C65 10μ35
L7 1m
R28
FM/AM TUNER
CF3
L6
FM TUNE LEVEL
VR1 33K
C16 0.022
C70 0.47μ50
R25 10K
C66 2.2μ50
C67 4.7μ50
VR2 10K
C69 4.7μ50
AM TUNE LEVEL
R26 10K
IC1
2.7V
3.9V
9.5V
7.1V
9.9V
1.5V
2.3V
1.2V
0V
1.5V
22
21
20
19
18
17
16
15
14
13
12
BUF
OSC
REG
RF
MIX
AGC
AM-IF
SD ADJ
DET
LEVEL DIT
LEVEL DIT
S CURVE
LED DRIVER
S METER
FM-IF
Q.D
POSI AMP
GND
VCC
1
2
3
4
5
6
7
8
9
10
11
2.3V
0V
10.3V
10.2V
9.9V
3.9V
0V
3.1V
1.4V
CF2
C19 0.022
C20 0.022
R29 10K
R30 4.7K
L8
R118 100 1/4W
C21 100P
R31 82
CF4
C17 0.01
C68 10μ35
C18 0.01
R27 3.3K
AM
R34 39K
C22 0.015
FM
AUTO STOP CONT.
5.9V
0V
Q12
R37 10K
R38 100K
0V
R39 10K
D5
R54 18K
R35 10K
R36 10K
C44 0.01
SYSTEM CONTROL
R91 10K
C36 220P
C37 220P
D12
D13
R92 10K
R96 100K
R97 100K
C38 0.047
PRESET 20
PRESET 12
STATION NAME
(M) 50KHz
(M) 9KHz
(M) FM100KHz
(M) AM100KHz
S1
STATION NAME AND PRESET
✱S3
CHANNEL SPACE
✱J27,33,45
C80 100μ10
R120 33 1/4W
L11 1μ
D6
R55 8.2K
CE2
CLOCK
DATA
AUTO/MANU
SD
CHANNEL SW
STATION NAME
TUNED
ST
SIRIAL DATA
SIRIAL BUSY
POWER
MUTE

(X05-341✱-✱✱)
IC1 : LA1265
IC2 : AN7470
IC3 : LM7001

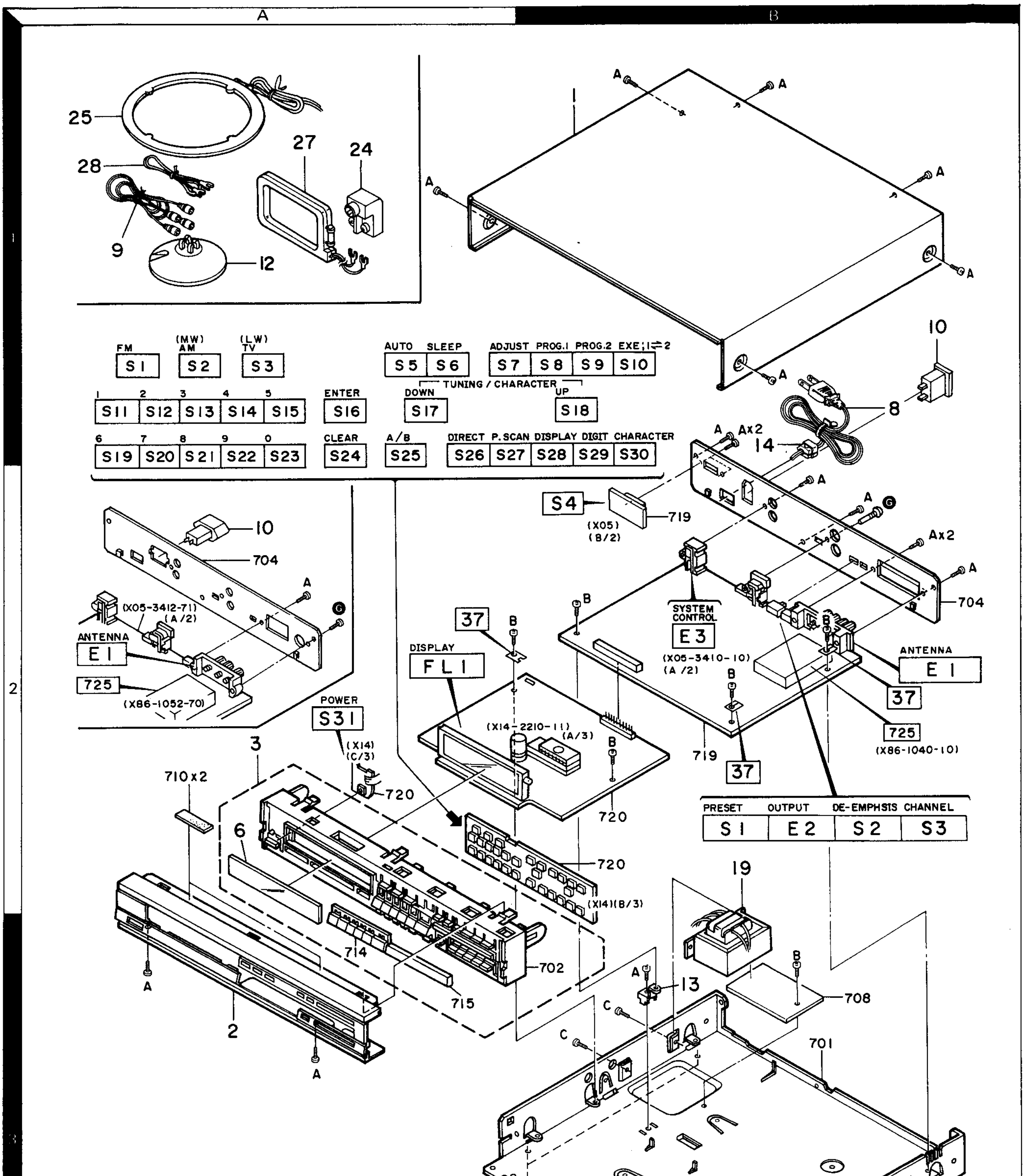
Q1 : 2SC1923(R,0)
Q2, 5,12,16,23
: 2SC945(A)(Q,P) or 2SC1740S(Q,R)
Q3 : 2SC1845(F,E)

Q13~15,19,25 : 2SA733(A)(Q,P) or 2SA933S(Q,R)

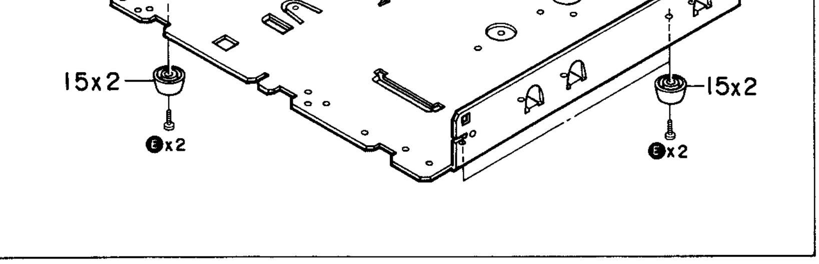
Q17,18 : 2SD1302(S,T)
Q20 : 2SD1266(Q,P)
Q22 : 2SA999(E,F)
Q24 : 2SC2003(L,K)

D1,4~8,11~13
: 1SS176 or 1SS133
D3 : KV1236(Z2)
D20~24 : DSM1A1
D25 : RD13ES(B2)
D26 : RD5.6ES(B2)

EXPLODED VIEW


A
B
1
2
3
25
27
24
28
9
12
10
8
14
A
Ax2
B
G
FM
(MW) AM
(LW) TV
S1
S2
S3
AUTO
SLEEP
S5
S6
ADJUST
PROG.1
PROG.2
EXE; 1⇌2
S7
S8
S9
S10
TUNING / CHARACTER
DOWN
UP
1
2
3
4
5
S11
S12
S13
S14
S15
ENTER
S16
S17
S18
6
7
8
9
0
S19
S20
S21
S22
S23
CLEAR
S24
A/B
S25
DIRECT
P.SCAN
DISPLAY
DIGIT
CHARACTER
S26
S27
S28
S29
S30
S4
(X05)
(B/2)
719
10
704
(X05-3412-71)
(A/2)
ANTENNA
E1
725
(X86-1052-70)
SYSTEM CONTROL
E3
(X05-3410-10)
(A/2)
704
ANTENNA
E1
37
725
(X86-1040-10)
37
DISPLAY
FL1
37
(X14-2210-11)
(A/3)
719
37
POWER
S31
(X14)
(C/3)
720
720
710x2
6
720
(X14)(B/3)
PRESET
OUTPUT
DE-EMPHSIS
CHANNEL
S1
E2
S2
S3
19
714
702
13
708
715
701
C
C
2
A
A
15x2
15x2
Ex2
Ex2

A	Ø 3x8	(Bi-Tap) BLK	: N89-3008-45
B	Ø 3x8	(Bi-Tap)	: N89-3008-46
C	Ø 4x6	(Bi-Tap)	: N89-4006-46
Ⓔ	Ø 3x8		: N09-1515-05
Ⓖ	Ø 3x19		: N09-0292-05



Parts with the exploded numbers larger than 700 are not suplied.

PARTS LIST

⁎ New Parts
Parts without **Parts No.** are not supplied.
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
T-91/91L						
1	1B	*	A01-1581-01	METALLIC CABINET	KUMUET	
1	1B	*	A01-1581-01	METALLIC CABINET	E	
1	1B	*	A01-1582-01	METALLIC CABINET	EF	
2	3A	*	A20-5317-02	PANEL	KUMUE	
2	3A	*	A20-5318-02	PANEL	TEEF	
3	2A	*	A22-0697-03	SUB PANEL ASSY	KUMUE	
3	2A	*	A22-0698-03	SUB PANEL ASSY	TEEF	
6	2A		B03-2324-04	DRESSING PLATE		
-			B46-0092-03	WARRANTY CARD	K	
-			B46-0094-03	WARRANTY CARD	UUE	
-			B46-0095-03	WARRANTY CARD	UUE	
-			B46-0122-13	WARRANTY CARD	E	
-			B46-0139-03	WARRANTY CARD	EF	
-			B46-0143-03	WARRANTY CARD	T	
-			B58-0223-04	CAUTION CARD (PRE-SET 120V)	U	
-			B58-0269-04	CAUTION CARD	K	
-			B58-0513-04	CAUTION CARD (PRESET220-240)	UE	
-			B58-0803-03	CAUTION CARD	EEF	
⚠ 8	1B		E30-0459-05	AC POWER CORD	EEF	
⚠ 8	1B		E30-0812-05	AC POWER CORD	UMUE	
⚠ 8	1B		E30-0996-05	AC POWER CORD	K	
⚠ 8	1B		E30-1416-05	AC POWER CORD	T	
⚠ 9	1A		E30-0505-05	AUDIO CORD	E	
9	1A		E30-0615-05	AUDIO CORD	KUMUET	
9	1A		E30-0615-05	AUDIO CORD	E	
⚠ 10	1B		E03-0041-05	AC OUTLET	KUMUE	
⚠ 10	2A		E03-0055-05	AC OUTLET	EEF	
⚠ 10	2A		E03-0085-05	AC OUTLET	T	
-		*	H01-7633-04	ITEM CARTON CASE	KUMUE	
-		*	H01-7635-04	ITEM CARTON CASE	TE	
-		*	H01-7637-04	ITEM CARTON CASE	EF	
-			H10-3378-12	POLYSTYRENE FOAMED FIXTURE	EF	
-		*	H10-3460-02	POLYSTYRENE FOAMED FIXTURE	KUMUET	
-		*	H10-3460-02	POLYSTYRENE FOAMED FIXTURE	E	
-			H25-0223-04	PROTECTION BAG (750X350X0.03)		
-			H25-0232-04	PROTECTION BAG (235X350X0.03)		
12	1A		J19-2815-04	ANTENNA HOLDER		
13	3B		J21-3738-04	UNIT MOUNTING HARDWARE		
14	1B		J42-0083-05	POWER CORD BUSHING		
15	3A,3B		J02-0170-04	FOOT		
-			J61-0307-05	WIRE BAND	TEEF	
⚠ 19	2B	*	L01-4641-05	POWER TRANSFORMER	K	
⚠ 19	2B	*	L01-4642-05	POWER TRANSFORMER	TEEF	
⚠ 19	2B	*	L01-4644-05	POWER TRANSFORMER	UMUE	
E	3A,3B		N09-1515-05	TAPPING SCREW (Ø3X8) FOOT		
G	2B		N09-0292-05	STEPPED SCREW (Ø3X19)		
24	1A		T90-0136-05	ANTENNA ADAPTOR	TEEF	
25	1A		T90-0138-15	LOOP ANTENNA	TE	
25	1A	*	T90-0153-05	LOOP ANTENNA	EF	
27	1A		T90-0104-25	LOOP ANTENNA	KUMUE	
28	1A		T90-0132-05	T TYPE ANTENNA (FM)		

E: Scandinavia & Europe **K**: USA **P**: Canada
U: PX(Far East, Hawaii) **T**: England **M**: Other Areas
UE: AAFES(Europe) **X**: Australia

K, U, M, UE types : T-91
E, T, EF types : T91L

⚠ indicates safety critical components.

PARTS LIST

⁎ New Parts

Parts without **Parts No.** are not supplied.

Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.

Teile ohne **Parts No.** werden nicht geliefert.

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Desti-nation 仕向	Re-marks 備考
			TUNER UNIT (X05-3410-10)			
C1 ,2			CK45FF1H103Z	CERAMIC 0. 010UF Z		
C3			CK45FF1H473Z	CERAMIC 0. 047UF Z		
C4			CK45FF1H223Z	CERAMIC 0. 022UF Z		
C5			CC45FTH1H101J	CERAMIC 100PF J	TEEF	
C6 -11			CK45FF1H223Z	CERAMIC 0. 022UF Z	TEEF	
C9 ,10			CK45FF1H223Z	CERAMIC 0. 022UF Z	KUMUE	
C12		*	CC45FCH1H151J	CERAMIC 150PF J	TEEF	
C13			CC93FCH1H221J	CERAMIC 220PF J	TEEF	
C14			CC93FCH1H391J	CERAMIC 390PF J		
C15			C91-0769-05	CERAMIC 0. 01UF M		
C16			CK45FF1H223Z	CERAMIC 0. 022UF Z		
C17			C91-0769-05	CERAMIC 0. 01UF M		
C18			CK45FF1H103Z	CERAMIC 0. 010UF Z		
C19 ,20			CK45FF1H223Z	CERAMIC 0. 022UF Z		
C21			CC45FSL1H101J	CERAMIC 100PF J		
C22			CF92FV1H153J	MF 0. 015UF J		
C23			CK45FB1H561K	CERAMIC 560PF K		
C24			CF92FV1H473J	MF 0. 047UF J		
C25			CC93FCH1H471J	CERAMIC 470PF J		
C26 ,27			CC45FSL1H151J	CERAMIC 150PF J	KUMUE	
C26 ,27			CK45FB1H102K	CERAMIC 1000PF K	TEEF	
C28			CC45FSL1H221J	CERAMIC 220PF J	TEEF	
C29 ,30			CF92FV1H153J	MF 0. 015UF J	UMUE	
C29 ,30			CF92FV1H223J	MF 0. 022UF J	K	
C29 ,30			CF92FV1H472J	MF 4700PF J	TEEF	
C31 ,32			CC45FSL1H101J	CERAMIC 100PF J	TEEF	
C33 ,34			CF92FV1H432J	MF 4300PF J	UMUE	
C35			C91-0769-05	CERAMIC 0. 01UF M		
C36 ,37			CC45FSL1H221J	CERAMIC 220PF J		
C38			CK45FF1H473Z	CERAMIC 0. 047UF Z		
C39 ,40			CC45FCH1H220J	CERAMIC 22PF J		
C41 -43			CK45FB1H102K	CERAMIC 1000PF K		
C44 ,45			CK45FF1H103Z	CERAMIC 0. 010UF Z		
C50			CK45F1H103Z	CERAMIC 0. 010UF Z		
C51 -55			CK45FF1H103Z	CERAMIC 0. 010UF Z		
C61			CE04KW1H010M	ELECTRO 1. 0UF 50WV		
C62			CE04KW1C101M	ELECTRO 100UF 16WV		
C63			CE04KW1H010M	ELECTRO 1. 0UF 50WV		
C64			CE04KW1C101M	ELECTRO 100UF 16WV		
C65			CE04KW1V100M	ELECTRO 10UF 35WV		
C66			CE04KW1H2R2M	ELECTRO 2. 2UF 50WV		
C67			CE04KW1H4R7M	ELECTRO 4. 7UF 50WV		
C68			CE04KW1V100M	ELECTRO 10UF 35WV		
C69			CE04KW1H4R7M	ELECTRO 4. 7UF 50WV		
C70			CE04KW1HR47M	ELECTRO 0. 47UF 50WV		
C71			CE04KW1C221M	ELECTRO 220UF 16WV		
C72 ,73			CE04KW1C220M	ELECTRO 22UF 16WV	TEEF	
C74 -76			CE04KW1H2R2M	ELECTRO 2. 2UF 50WV	TEEF	
C74 ,75			CE04KW1HR33M	ELECTRO 0. 33UF 50WV	KUMUE	
C76			CE04KW1H2R2M	ELECTRO 2. 2UF 50WV	KUMUE	
C77			CE04KW1H3R3M	ELECTRO 3. 3UF 50WV		
C78			CE04KW1HR47M	ELECTRO 0. 47UF 50WV		
C79			CE04KW1V100M	ELECTRO 10UF 35WV		

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C80			CE04KW1A101M	ELECTRO 100UF 10WV		
C81			CE04KW1V100M	ELECTRO 10UF 35WV		
C82			CE04KW1C221M	ELECTRO 220UF 16WV		
C83			CE04KW1E221M	ELECTRO 220UF 25WV		
C84			CE04KW1E102M	ELECTRO 1000UF 25WV		
C85			CE04KW1E101M	ELECTRO 100UF 25WV		
C86			CE04KW1H331M	ELECTRO 330UF 50WV		
C87			CE04KW1C470M	ELECTRO 47UF 16WV		
C88			CE04KW0J102M	ELECTRO 1000UF 6.3WV		
TC1			C05-0097-05	CERAMIC TRIMMER CAPACITOR(30PF	TEEF	
TC2			C05-0303-05	CERAMIC TRIMMER CAPACITOR(20PF		
TC3			C05-0097-05	CERAMIC TRIMMER CAPACITOR(30PF	TEEF	
TC4			C05-0303-05	CERAMIC TRIMMER CAPACITOR(20PF		
37	2B		E23-0149-05	TERMINAL		
E1	2A		E20-0318-05	SCREW TERMINAL BOARD(2P) ANT	TEEF	
E1	2B		E20-0449-05	SCREW TERMINAL BOARD(4P)ANT	KUMUE	
E2	2B		E13-0217-05	PHONO JACK (2P) OUTPUT		
E3	2B		E11-0168-05	MINIATURE PHONE JACK(SYNCRO)		
CF1 ,2		*	L72-0531-05	CERAMIC FILTER	KUMUE	
CF1 ,2			L72-0536-05	CERAMIC FILTER	TEEF	
CF4			L72-0096-05	CERAMIC FILTER		
L1			L40-1092-17	SMALL FIXED INDUCTOR(1UH,M)	TEEF	
L2			L31-0499-05	LW-RF COIL	TEEF	
L3			L31-0509-05	MW-RF COIL		
L4			L32-0288-05	LW OSCILLATING COIL	TEEF	
L5			L32-0277-15	MW OSCILLATING COIL		
L6			L30-0454-05	AM IFT		
L7			L40-1021-14	SMALL FIXED INDUCTOR(1.0MH,K)		
L8			L30-0439-15	FM IFT		
L9			L79-0125-05	LC FILTER	TEEF	
L10		*	L79-0750-05	LC FILTER	TEEF	
L11 ,12			L40-1092-17	SMALL FIXED INDUCTOR(1UH,M)		
X1			L77-1122-05	CRYSTAL RESONATOR		
R111			RS14KB3A561J	FL-PROOF RS 560 J 1W	UMUETE	
R111			RS14KB3A561J	FL-PROOF RS 560 J 1W	EF	
R111			RS14KB3A681J	FL-PROOF RS 680 J 1W	K	
R116-119			RD14GB2E101J	FL-PROOF RD 100 J 1/4W		
R120			RD14GB2E330J	FL-PROOF RD 33 J 1/4W		
R121			RS14KB3A221J	FL-PROOF RS 220 J 1W		
R122			RS14KB3A101J	FL-PROOF RS 100 J 1W		
R130			R92-0173-05	RC 2.2M M 1/2W	K	
VR1			R12-3130-05	TRIMMING POT.(33K) FM TUNE LVL		
VR2			R12-3126-05	TRIMMING POT.(10K) AM TIME LVL		
VR3			R12-1089-05	TRIMMING POT.(4.7K)VCO		
VR4			R12-5060-05	TRIMMING POT.(220K)SEPARATION	TEEF	
⚠ K1			S51-1036-05	MAGNETIC RELAY		
S1	2B		S31-2075-05	SLIDE SWITCH (PRESET)	KTEEF	
S1 -3	2B		S31-2075-05	SLIDE SWITCH(PRESET,DE-EMPH,CH	UMUE	
S3	2B		S31-2075-05	SLIDE SWITCH (CHANNEL SPACE)	TEEF	
⚠ S4	2B		S31-2115-05	SLIDE SWITCH (POWER)	UMUE	
D1			1N4148	DIODE	EF	
D1			1SS133	DIODE	KUMUET	
D1			1SS133	DIODE	EF	
D1			1SS176	DIODE	KUMUET	

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D1			1SS176	DIODE	E	
D2 ,3			KV1236(Z2)	VARIABLE CAPACITANCE DIODE	TEEF	
D3			KV1236(Z2)	VARIABLE CAPACITANCE DIODE	KUMUE	
D4 -8			1N4148	DIODE	EF	
D4 -8			1SS133	DIODE	KUMUET	
D4 -8			1SS133	DIODE	E	
D4 -8			1SS176	DIODE	KUMUET	
D4 -8			1SS176	DIODE	E	
D11 -13			1N4148	DIODE	EF	
D11 -13			1SS133	DIODE	KUMUET	
D11 -13			1SS133	DIODE	E	
D11 -13			1SS176	DIODE	KUMUET	
D11 -13			1SS176	DIODE	E	
D20 -24			DSM1A1	DIODE	KUMUET	
D20 -24			DSM1A1	DIODE	E	
D20 -24			1N4004	DIODE	EF	
D25		*	BZX55-C13	DIODE	EF	
D25			HZS13N(B2)	ZENER DIODE	KUMUET	
D25			HZS13N(B2)	ZENER DIODE	E	
D25			RD13ES(B2)	ZENER DIODE	KUMUET	
D25			RD13ES(B2)	ZENER DIODE	E	
D26		*	BZX55-C5V6	DIODE	EF	
D26			HZS5.6N(B2)	ZENER DIODE	KUMUET	
D26			HZS5.6N(B2)	ZENER DIODE	E	
D26			RD5.6ES(B2)	ZENER DIODE	KUMUET	
D26			RD5.6ES(B2)	ZENER DIODE	E	
IC1			LA1265	IC(FM/AM TUNER)		
IC2			AN7470	IC(FM MPX)		
IC3			LM7001	IC(PLL FREQUENCY SYNTHESIZER)		
Q1			2SC1923(R,O)	TRANSISTOR		
Q2			JC501(P,Q)	TRANSISTOR	EF	
Q2			2SC1740S(Q,R)	TRANSISTOR	KUMUET	
Q2			2SC1740S(Q,R)	TRANSISTOR	E	
Q2			2SC945(A)(Q,P)	TRANSISTOR	KUMUET	
Q2			2SC945(A)(Q,P)	TRANSISTOR	E	
Q3			2SC1845(F,E)	TRANSISTOR		
Q4			2SK364(GR,BL)	FET	TEEF	
Q5			2SC1740S(Q,R)	TRANSISTOR	KUMUE	
Q5			2SC945(A)(Q,P)	TRANSISTOR	KUMUE	
Q5 -8			JC501(P,Q)	TRANSISTOR	EF	
Q5 -8			2SC1740S(Q,R)	TRANSISTOR	TE	
Q5 -8			2SC945(A)(Q,P)	TRANSISTOR	TE	
Q9 ,10			2SK364(GR,BL)	FET	TEEF	
Q11 ,12			JC501(P,Q)	TRANSISTOR	EF	
Q11 ,12			2SC1740S(Q,R)	TRANSISTOR	TE	
Q11 ,12			2SC945(A)(Q,P)	TRANSISTOR	TE	
Q12			2SC1740S(Q,R)	TRANSISTOR	KUMUE	
Q12			2SC945(A)(Q,P)	TRANSISTOR	KUMUE	
Q13 -15			JA101(P,Q)	TRANSISTOR	EF	
Q13 -15			2SA733(A)(Q,P)	TRANSISTOR	KUMUET	
Q13 -15			2SA733(A)(Q,P)	TRANSISTOR	E	
Q13 -15			2SA933S(Q,R)	TRANSISTOR	KUMUET	
Q13 -15			2SA933S(Q,R)	TRANSISTOR	E	
Q16			JC501(P,Q)	TRANSISTOR	EF	
Q16			2SC1740S(Q,R)	TRANSISTOR	KUMUET	

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Q16			2SC1740S(Q,R)	TRANSISTOR	E	
Q16			2SC945(A)(Q,P)	TRANSISTOR	KUMUET	
Q16			2SC945(A)(Q,P)	TRANSISTOR	E	
Q17 ,18			2SD1302(S,T)	TRANSISTOR		
Q19			JA101(P,Q)	TRANSISTOR	EF	
Q19			2SA733(A)(Q,P)	TRANSISTOR	KUMUET	
Q19			2SA733(A)(Q,P)	TRANSISTOR	E	
Q19			2SA933S(Q,R)	TRANSISTOR	KUMUET	
Q19			2SA933S(Q,R)	TRANSISTOR	E	
Q20			2SD1266(Q,P)	TRANSISTOR		
Q22			2SA999(E,F)	TRANSISTOR		
Q23			JC501(P,Q)	TRANSISTOR	EF	
Q23			2SC1740S(Q,R)	TRANSISTOR	KUMUET	
Q23			2SC1740S(Q,R)	TRANSISTOR	E	
Q23			2SC945(A)(Q,P)	TRANSISTOR	KUMUET	
Q23			2SC945(A)(Q,P)	TRANSISTOR	E	
Q24			2SC2003(L,K)	TRANSISTOR		
Q25			JA101(P,Q)	TRANSISTOR	EF	
Q25			2SA733(A)(Q,P)	TRANSISTOR	KUMUET	
Q25			2SA733(A)(Q,P)	TRANSISTOR	E	
Q25			2SA933S(Q,R)	TRANSISTOR	KUMUET	
Q25			2SA933S(Q,R)	TRANSISTOR	E	
Q26			JC501(P,Q)	TRANSISTOR	EF	
Q26			2SC1740S(Q,R)	TRANSISTOR	TE	
Q26			2SC945(A)(Q,P)	TRANSISTOR	TE	
DISPLAY UNIT (X14-2210-11)						
C1			C91-0757-05	CERAMIC 0.001UF K		
C2 ,3			CK45FB1H102K	CERAMIC 1000PF K		
C5			CK45FB1H102K	CERAMIC 1000PF K		
C8 ,9			CC45FCH1H330J	CERAMIC 33PF J		
C10			CE04KW1V100M	ELECTRO 10UF 35WV		
C11			CE04KW0J222M	ELECTRO 2200UF 6.3WV		
C12			C90-1400-05	NP-ELEC 10UF 50WV		
C13			CE04KW1C220M	ELECTRO 22UF 16WV		
C14			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C15			C91-0769-05	CERAMIC 0.01UF M		
C16			CE04KW1HR47M	ELECTRO 0.47UF 50WV		
C17 ,18			CK45FB1H102K	CERAMIC 1000PF K		
X1			L77-1118-05	CRYSTAL RESONATOR		
R62			RS14KB3A681J	FL-PROOF RS 680 J 1W	TEEF	
R62			RS14KB3A821J	FL-PROOF RS 820 J 1W	KUMUE	
S1 -3	1A,1B		S40-1064-05	PUSH SWITCH (FM,MW,LW)	TEEF	
S1 ,2	1A,1B		S40-1064-05	PUSH SWITCH (FM,AM)	KUMUE	
S5 -31	1A,1B		S40-1064-05	PUSH SWITCH		
D1 -4			1N4148	DIODE	EF	
D1 -4			1SS133	DIODE	KUMUET	
D1 -4			1SS133	DIODE	E	
D1 -4			1SS176	DIODE	KUMUET	
D1 -4			1SS176	DIODE	E	
D6 -8			1N4148	DIODE	EF	
D6 -8			1SS133	DIODE	UMUETE	
D6 -8			1SS176	DIODE	UMUETE	
D7 ,8			1SS133	DIODE	K	

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D7 ,8			1SS176	DIODE	K	
D9			BZX55-C5V1	DIODE	EF	
D9			HZS5.1N(B)	ZENER DIODE	KUMUET	
D9			HZS5.1N(B)	ZENER DIODE	E	
D9			RD5.1ES(B)	ZENER DIODE	KUMUET	
D9			RD5.1ES(B)	ZENER DIODE	E	
D10 -13			1SS133	DIODE	KUMUE	
D10 -13			1SS176	DIODE	KUMUE	
D10 -19			1N4148	DIODE	EF	
D10 -19			1SS133	DIODE	TE	
D10 -19			1SS176	DIODE	TE	
D16 -19			1SS133	DIODE	KUMUE	
D16 -19			1SS176	DIODE	KUMUE	
FL1	2A		FIP12PM7	FLUORESCENT INDICATOR TUBE		
IC1		*	CXP5016-210S	IC(MICROPROCESSOR)		
Q1 -3			JA101(P,Q)	TRANSISTOR	EF	
Q1 -3			2SA733(A)(Q,P)	TRANSISTOR	UMUETE	
Q1 -3			2SA933S(Q,R)	TRANSISTOR	UMUETE	
Q2 ,3			2SA733(A)(Q,P)	TRANSISTOR	K	
Q2 ,3			2SA933S(Q,R)	TRANSISTOR	K	
Q4 ,5			JC501(P,Q)	TRANSISTOR	EF	
Q4 ,5			2SC1740S(Q,R)	TRANSISTOR	KUMUET	
Q4 ,5			2SC1740S(Q,R)	TRANSISTOR	E	
Q4 ,5			2SC945(A)(Q,P)	TRANSISTOR	KUMUET	
Q4 ,5			2SC945(A)(Q,P)	TRANSISTOR	E	
Q6 ,7			JA101(P,Q)	TRANSISTOR	EF	
Q6 ,7			2SA733(A)(Q,P)	TRANSISTOR	KUMUET	
Q6 ,7			2SA733(A)(Q,P)	TRANSISTOR	E	
Q6 ,7			2SA933S(Q,R)	TRANSISTOR	KUMUET	
Q6 ,7			2SA933S(Q,R)	TRANSISTOR	E	
Q9			JC501(P,Q)	TRANSISTOR	EF	
Q9			2SC1740S(Q,R)	TRANSISTOR	KUMUET	
Q9			2SC1740S(Q,R)	TRANSISTOR	E	
Q9			2SC945(A)(Q,P)	TRANSISTOR	KUMUET	
Q9			2SC945(A)(Q,P)	TRANSISTOR	E	
FRONT-END UNIT (K, U, M, UE. X86-1040-10)						
C1		*	CC41FSL1H060D	CYLND CHIP C 6.0PF D		
C2			CK41DY1C103M	CYLND CHIP C 0.010UF M		
C3		*	CC41FSL1H100D	CYLND CHIP C 10PF D		
C4			CK41DY1C103M	CYLND CHIP C 0.010UF M		
C5			CK41FB1H221K	CYLND CHIP C 220PF K		
C6		*	CC41FSL1H070D	CYLND CHIP C 7.0PF D		
C8			CC41FSL1H020C	CYLND CHIP C 2.0PF C		
C9			CK41FB1H221K	CYLND CHIP C 220PF K		
C10			CK41DY1C103M	CYLND CHIP C 0.010UF M		
C11		*	CC41FSL1H080D	CYLND CHIP C 8.0PF D		
C12		*	CC41FSL1H010C	CYLND CHIP C 1.0PF C		
C14			CK41DY1C103M	CYLND CHIP C 0.010UF M		
C16		*	CC41FSL1H080D	CYLND CHIP C 8.0PF D		
C17			CC41FSL1H330J	CYLND CHIP C 33PF J		
C18		*	CC41FSL1H150J	CYLND CHIP C 15PF J		
C19		*	CC41FSL1H010C	CYLND CHIP C 1.0PF C		
C20			CK41FY1E102M	CYLND CHIP C 1000PF M		
C21		*	CC41FSL1H470J	CYLND CHIP C 47PF J		
TC1			C05-0302-05	CERAMIC TRIMMER CAPACITOR(11PF		

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L1		*	L31-0551-05	FM-RF COIL		
L2		*	L31-0552-05	FM-RF COIL		
L3		*	L31-0553-05	FM-RF COIL		
L4			L40-1092-16	SMALL FIXED INDUCTOR(1UH,M)		
L7			L32-0318-05	FM OSCILLATING COIL		
T1		*	L30-0427-15	FM IFT (DISTORTION)		
-						
-			R92-0338-05	CLYND CHIP R 0 OHM		
			R92-0350-05	JUMPER WIRE (RESISTOR TYPE)		
R1 ,2			RD41FB2B473J	CYLND CHIP R 47K J 1/8W		
R3		*	RD41FB2B470J	CYLND CHIP R 47 J 1/8W		
R4			RD41FB2B331J	CYLND CHIP R 330 J 1/8W		
R5			RD41FB2B101J	CYLND CHIP R 100 J 1/8W		
R6			RD41FB2B473J	CYLND CHIP R 47K J 1/8W		
R9			RD41FB2B105J	CYLND CHIP R 1.0M J 1/8W		
R11			RD41FB2B101J	CYLND CHIP R 100 J 1/8W		
R14			RD41FB2B472J	CYLND CHIP R 4.7K J 1/8W		
R15 ,16			RD41FB2B223J	CYLND CHIP R 22K J 1/8W		
R17			RD41FB2B222J	CYLND CHIP R 2.2K J 1/8W		
R18			RD41FB2B224J	CYLND CHIP R 220K J 1/8W		
R19 ,20			RD41FB2B101J	CYLND CHIP R 100 J 1/8W		
D1		*	KV1310A-3	VARIABLE CAPACITANCE DIODE		
Q1			2SK302(Y,GR)	FET		
Q2		*	2SC2714(O)	TRANSISTOR		
Q4 ,5		*	2SC2714(R,O)	TRANSISTOR		
FRNT-END UNIT (T, E, EF. X86-1052-70)						
C1			CC41FSL1H060D	CYLND CHIP C 6.0PF D		
C2			CK41DY1C103M	CYLND CHIP C 0.010UF M		
C3			CC41FSL1H100D	CYLND CHIP C 10PF D		
C4			CK41DY1C103M	CYLND CHIP C 0.010UF M		
C5			CK41FB1H221K	CYLND CHIP C 220PF K		
C6			CC41FSL1H100D	CYLND CHIP C 10PF D		
C7			CC41FSL1H060D	CYLND CHIP C 6.0PF D		
C8			CC41FSL1H100D	CYLND CHIP C 10PF D		
C9			CK41FB1H221K	CYLND CHIP C 220PF K		
C10			CK41DY1C103M	CYLND CHIP C 0.010UF M		
C11			CK41FY1E102M	CYLND CHIP C 1000PF M		
C12		*	CC41FSL1H030C	CYLND CHIP C 3.0PF C		
C13			CC41FSL1H100D	CYLND CHIP C 10PF D		
C14			CK41DY1C103M	CYLND CHIP C 0.010UF M		
C16			CC41FSL1H080D	CYLND CHIP C 8.0PF D		
C17			CC41FSL1H330J	CYLND CHIP C 33PF J		
C18			CC41FSL1H150J	CYLND CHIP C 15PF J		
C19			CC41FSL1H010C	CYLND CHIP C 1.0PF C		
C20			CK41FY1E102M	CYLND CHIP C 1000PF M		
C21			CC41FSL1H470J	CYLND CHIP C 47PF J		
TC1			C05-0302-05	CERAMIC TRIMMER CAPACITOR(11PF		
L1			L31-0551-05	FM-RF COIL		
L2			L31-0552-05	FM-RF COIL		
L3			L31-0553-05	FM-RF COIL		
L4			L40-1092-16	SMALL FIXED INDUCTOR(1UH,M)		
L5		*	L31-0554-05	FM-RF COIL		
L7			L32-0318-05	FM OSCILLATING COIL		
T1			L30-0427-15	FM IFT		

E: Scandinavia & Europe	**K:** USA	**P:** Canada
U: PX(Far East, Hawaii)	**T:** England	**M:** Other Areas
UE : AAFES(Europe)	**X:** Australia	

K, U, M, UE types : T-91
E, T, EF types : T91L

⚠ indicates safety critical components.

PARTS LIST

⁎ New Parts
Parts without **Parts No.** are not supplied.
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
-			R92-0338-05	CLYND CHIP R 0 OHM		
-			R92-0350-05	JUMPER WIRE (RESISTOR TYPE)		
R1			RD41FB2B473J	CYLND CHIP R 47K J 1/8W		
R2			RD41FB2B104J	CYLND CHIP R 100K J 1/8W		
R3			RD41FB2B470J	CYLND CHIP R 47 J 1/8W		
R4			RD41FB2B331J	CYLND CHIP R 330 J 1/8W		
R5			RD41FB2B101J	CYLND CHIP R 100 J 1/8W		
R6 ,7			RD41FB2B473J	CYLND CHIP R 47K J 1/8W		
R8 ,9			RD41FB2B104J	CYLND CHIP R 100K J 1/8W		
R11			RD41FB2B101J	CYLND CHIP R 100 J 1/8W		
R12			RD41FB2B681J	CYLND CHIP R 680 J 1/8W		
R13			RD41FB2B104J	CYLND CHIP R 100K J 1/8W		
R14			RD41FB2B472J	CYLND CHIP R 4.7K J 1/8W		
R15 ,16			RD41FB2B223J	CYLND CHIP R 22K J 1/8W		
R17			RD41FB2B222J	CYLND CHIP R 2.2K J 1/8W		
R18			RD41FB2B224J	CYLND CHIP R 220K J 1/8W		
R19 ,20			RD41FB2B101J	CYLND CHIP R 100 J 1/8W		
D1 -4			KV1310-4	VARIABLE CAPACITANCE DIODE		
Q1			2SK302(Y,GR)	FET		
Q2		*	3SK131(M,L)	FET		
Q3			2SK302(Y,GR)	FET		
Q4 ,5			2SC2714(R,O)	TRANSISTOR		

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⚠ indicates safety critical components.

T-91/91L

SPECIFICATIONS

FM tuner section

Frequency range	87.5 MHz — 108 MHz
Sensitivity at 75 ohms MONO: S/N 26 dB, 40 kHz Dev.	0.7 μV
STEREO: S/N 46 dB, 46 kHz DEV.	32.0 μV
Limiting level at 75 ohms −3 dB point, 40 kHz dev.	0.8 μV
Frequency responce 30 Hz — 15 kHz	+0.5 dB, −2.5 dB
Total harmonic distortion	
MONO: 1 kHz, 40 kHz dev	0.15%
STEREO: 1 kHz, 46 kHz dev	0.5%
Signal-to-Noise ratio unweighted	
MONO: 40 kHz dev.: 1 mV input	67 dB (DIN)
STEREO: 46 kHz dev.: 1 mV input	61 dB (DIN)
Signal-to-Noise ratio weighted	
MONO: 40 kHz dev.: 1 mV input	68 dB (DIN)
STEREO: 46 kHz dev.: 1 mV input	62 dB (DIN)
Capture ratio	2.0 dB
Alternate channel selectivity	67 dB (DIN: ±300 kHz)
FM stereo separation: 1 mV input	
1 kHz	46 dB
6.3 kHz	37 dB
Image rejection ratio (98 MHz)	76 dB (Europe), 48 dB (Others)
IF rejection ratio (98 MHz)	90 dB (Europe), 87 dB (Others)
Spurious rejection ratio (98 MHz)	100 dB (Europe), 80 dB (Others)
AM suppression ratio	68 dB (Europe), 65 dB (Others)
Sub-carrier suppression ratio	
do. 19 kHz, 46 kHz, Dev.	65 dB
do. 38 kHz, 46 kHz, Dev.	70 dB
Output level/impedance at 1 kHz, 100% Dev.	0.6 V/3.3 kohms

MW tuner section

Tuning Frequency Range	531 kHz ~ 1602 kHz
Usable sensitivity	14 μV (500 μV/m)
Signal-to-Noise ratio (30% Mod, 1 mV input)	49 dB
Total harmonic distortion	0.6%
Image rejection ratio	40 dB
Selectivity (IHF)	23 dB
Output level/impedance (400 Hz, 30% Mod.)	0.18 V, 3.3 kohms

LW tuner section

Tuning frequency range	153 kHz ~ 281 kHz
Usable sensitivity	14 μV (900 μV/m)
Signal-to-Noise ratio (30% Mod, 1 mV input)	47 dB
Total harmonic distortion	0.6%
Image rejection ratio	37 dB
Selectivity (IHF)	30 dB
Output level/impedance (400 Hz, 30% Mod.)	0.18 V, 3.3 kohms

General

Power consumption	10 W
Dimensions	W: 340 mm (13-3/8")
	H: 59 mm (2-5/16")
	D: 359 mm (14-1/8")
Weight (Net)	2.8 kg (6.2 lb)

Note

Component and circuitry are subject to modification to insure best operation under differing local conditions. This manual is based on the U.S.A (K) standard, and provides information on regional circuit modification through use of alternate schematic diagrams, and information on regional component variations through use of parts list.

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